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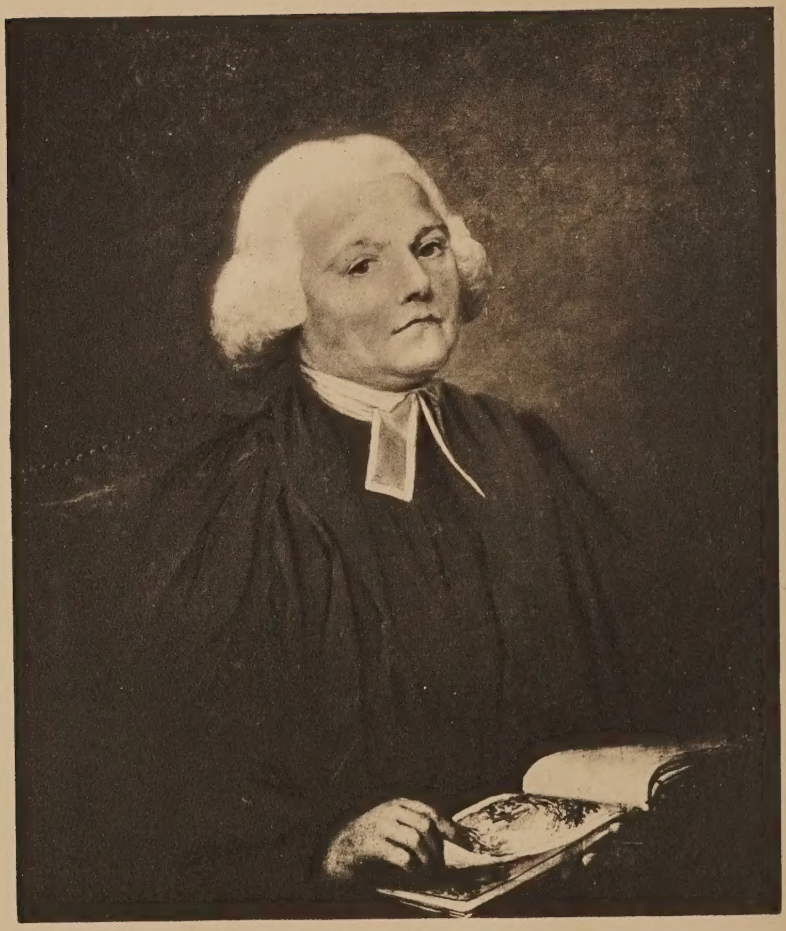
THE NATURAL HISTORY OF SELBORNE



GILBERT WHITE.

From a painting in possession of Mr. John Glen.

THE NATURAL HISTORY OF SELBORNE

By
GILBERT WHITE

Edited, with an Introduction and Notes, by
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EDITOR'S PREFACE

THE text here given, apart from the correction of obvious printer's errors, follows the First Edition. That is to say, capitals, italics, hyphens and so on stand as they were when *The Natural History of Selborne* was first published; except the obsolete f's nothing has been amended simply in order to conform with modern convention. There seems no risk of obscurity arising from these old usages; they are in harmony with the old-fashioned diction, and their retention helps to keep alive the original atmosphere. The *Notes* written by Gilbert White himself go beneath the text precisely as they were placed from the beginning. *Editorial Notes*, indicated by figures, are placed at the end of the letter concerned. It is hoped that this simple distinction will be clearly understood; there is no alternative except initialling a double set of notes, or jarring the reader's nerves with a continual insistent *Ed.*

The framing of the editorial notes has been guided by these principles:

They are to be kept as concise as possible.

They are not to explain or describe anything which does not definitely help towards an understanding of the passage in question.

They are to warn the reader against observations or deductions now known to be incorrect.

They are to give, where an author now little known is quoted by Gilbert White, his period and scope, and also some idea of his character and his reputation at that time, such as any well-informed reader must have had when *Selborne* was first published.

Where Gilbert White quotes a Latin passage which it is necessary to understand in order to follow his meaning a translation is to be supplied; but Latin verse quoted simply as an embellishment is not to be translated.

Where the identity of a species referred to by Gilbert White is not clear it is to be indicated by a footnote even if it has already been explained, but longer footnotes are not to be repeated whenever the reference occurs. Nor does it seem desirable to indicate at every repetition the page where the footnote is to be found, which on so large a scale would prove a distraction to the reader. The Index (divided into Species, Names and Places, and General) shows the location of the editorial notes on every subject dealt with. In the special case of migration, which is discussed over and over again in the Letters, a full treatment is attempted in an Introductory Chapter.

In rare cases contemporary accounts, or other writings of Gilbert White are drawn upon to amplify or correct the text.

In no case is the reader to be referred to the inaccessible back files of some periodical or the transactions of a learned society, nor to books difficult to obtain or likely soon to be out of date. Such false economy may save space, but it leads to the ignoring or inadequate treatment of passages which the average reader is unlikely to be able to understand without editorial help. In an edition of this sort such a fault is at least as much to be avoided as prolixity or irrelevance.

The amount and choice of additional matter has varied in different editions, most editors including the *Naturalist's Calendar, Poems,* and *Observations on Various Parts of Nature,* some the *Antiquities* also, and some a miscellaneous series of private letters of very mixed quality. The book has consequently lost the unity which its author stamped upon it. In attempting to restore that unity the present editor has, at the risk of being considered more royalist than the king, suppressed the *Antiquities.* They were included in the first edition, and there is no doubt that Gilbert White regarded them as an integral part of his work, but they were a compilation, made largely by other hands, without appreciable literary or historical value, and admirers of *Selborne* from the time of John Mulso onwards have agreed in regarding them as a mistake. They are, on the whole, too dull to be read for pleasure by any normal person, and their omission undoubtedly raises the standard of the book. The addition of a jumble of correspondence not intended for publication is rendered unnecessary by their inclusion at length in the *Life and Letters. The Summary of the Weather* is interesting for purposes of comparison, and is therefore included. *The Observations on Various Parts of Nature,* consisting of passages which Aikin abstracted indiscriminately from the Journals with very mediocre notes by Markwick, neither form a part of the original work, nor do justice to its author ; they are omitted from this edition. The Poems have clearly deserved inclusion. *The Naturalist's Calendar* was compiled by Aikin with extraordinary carelessness. Gilbert White is credited with recording the arrival of four, if not five species of willow-wren, and the word " appears," which he uses for " is seen," is assumed to indicate a first occurrence for the year, with absurd results. The Calendar as it stands is too unsatisfactory to deserve a place, but it has been allowed one in almost every edition from the second onwards, and it would undoubtedly be missed. It is therefore replaced by a brief calendar of the principal events of the year, giving the earliest and latest dates recorded by Gilbert White, Markwick, the Marsham family (over five generations), and the averages obtained from the numerous amateur observers of the Royal Meteorological Society. A Synonymy of names used in *Selborne* and their modern equivalents has been compiled for this edition.

The impersonal editorial treatment attempted has forbidden the acknowledgment of sources of information in the text. The chief is naturally the admirable *Life and Letters* by Mr. Rashleigh Holt-White, which any editor must be bound, as I have been, to lay under heavy contribution in recording the naturalist's career. The long article in the *Dictionary of National Biography* sums up Professor Newton's knowledge of his subject, but is now in some respects out of date. Of previous editions only that produced by L. C. Miall and W. Warde Fowler has been of much service, or emerged with any credit from the close scrutiny of sources which a scrupulous editor is obliged to make. Those of Professor Bell, Grant Allen, Bowdler Sharpe, Blyth and the original issue, have been freely referred to, with many others from which nothing of value could be gleaned. While it would obviously be absurd for an editor not to take cognizance of his predecessors' opinions or researches, nothing has been accepted on trust without the fullest investigation. The following list includes the principal works consulted:

CONTEMPORARY.

The White MSS. (Letters to Pennant and Barrington, Naturalist's Journals, etc.) in the British Museum.

James Wyburd's *Geometrical Survey of Alice Holt and Wolmer Forest*, and the *Sixth Report of the Commissioners of Woods and Forests* (1789).

Thomas Milne's survey of Hampshire, 1788–90 (published by W. Faden, 1791), from which the contemporary map of the Selborne neighbourhood is reproduced.

Pennant: *British Zoology*, 2nd and 4th Ed., 1768 and 1776–7.

Barrington: *Miscellanies*, 1781.

James Woodforde: *Diary of a Country Parson*, edited by John Beresford, 1924–27.

Ray's *Philosophical Letters* (Ed. W. Derham, 1718).

Linnæus: *Systema Naturae* (12th Ed., Upsala, 1766).

Encyclopædia Britannica (4th Ed., 1797).

Philosophical Transactions (1774, etc.).

Annual Register.

Gentleman's Magazine.

John Mulso: *Letters to Gilbert White* (Ed. R. Holt-White, 1907).

Sir Richard Baker: *Chronicle of the Kings of England* (1653 Ed.).

MODERN.

Rashleigh Holt-White: *Life and Letters of Gilbert White*. 2 Vols. (1901).

The Selborne Magazine.

Dictionary of National Biography.

Encyclopædia Britannica.

New English Dictionary (Oxford, 1897–1928).
W. H. Mullens : *Gilbert White of Selborne* (1907).
R. B. Sharpe : *Whitefriars Club Pilgrimage to Selborne* (1901).
E. Jesse : Gleanings in Natural History (1832–5).
L. C. Miall : *Early Naturalists* (1912).
The Victoria County History of Hampshire.
R. Mudie : *Hampshire.* 3 Vols. (1838).
J. E. Kelsall and P. Munn : *Birds of Hampshire* (1905).
The Zoologist.
J. E. Harting : *Our Summer Migrants* (1875).
H. Eliot Howard : *Territory in Bird Life* (1920).
A Practical Handbook of British Birds (Ed. H. F. Witherby, 1919–24).
W. E. Collinge : *Food of Some British Wild Birds* (2nd Ed., 1924–26).
H. K. Swann : *Geographical Bibliography of British Ornithology* (1919–20).
W. H. Mullens and H. Kirke Swann : *Bibliography of British Ornithology.*
G. E. H. Barrett Hamilton and M. A. C. Hinton : *History of British Mammals* (1910–21).
W. H. Hudson : *Hampshire Days* (1923 Ed.).
E. A. Martin : *A Bibliography of Gilbert White* (1897).
R. Markland : *Links between Dr. Samuel Johnson and Rev. G. White.*
C. S. Elton : *Animal Ecology* (1927).
J. Travis Jenkins : *The Fishes of the British Isles* (1925).
Quarterly Journal of the Royal Meteorological Society. Vol. LII, pp. 27–54 ; *The Marsham Phenological Record in Norfolk, 1736–1925, and some others* (Ivan D. Margary) ; pp. 277–320, *Report on the Phenological Observations in the British Isles* (1926).
A. Landsborough Thomson : *Problems of Bird Migration* (1926).
British Birds Magazine (1907–28).
Sir G. Newman : *Interpreters of Nature* (1927).
J. H. Clapham : *An Economic History of Great Britain,* Vol. I. (1926).
R. H. Clutterbuck : *Notes on the Parishes of Fyfield. . . .* (Salisbury, 1898).

In addition, all the more important editions of *Selborne* have been consulted, together with a large number of other works, in most of which nothing relevant was found. This list is simply intended to form a general set of references to the subject and an acknowledgment of the sources to which this edition is chiefly indebted. The Editor has also to thank Mr. O. W. Richards for help in the identification of insects.

ADVERTISEMENT
TO THE FIRST EDITION

THE Author of the following Letters takes the liberty, with all proper deference, of laying before the public his idea of *parochial history*, which, he thinks, ought to consist of natural productions and occurrences as well as antiquities. He is also of opinion that if stationary men would pay some attention to the districts on which they reside, and would publish their thoughts respecting the objects that surround them, from such materials might be drawn the most complete county-histories, which are still wanting in several parts of this kingdom, and in particular in the county of *Southampton*.

And here he seizes the first opportunity, though a late one, of returning his most grateful acknowledgments to the reverend the President and the reverend and worthy the Fellows of *Magdalen College* in the University of *Oxford*, for their liberal behaviour in permitting their archives to be searched by a member of their own society, so far as the evidences therein contained might respect the parish and priory of *Selborne*. To that gentleman also, and his assistant, whose labours and attention could only be equalled by the very kind manner in which they were bestowed, many and great obligations are also due.

Of the authenticity of the documents above-mentioned there can be no doubt, since they consist of the identical deeds and records that were removed to the College from the Priory at the time of its dissolution; and, being carefully copied on the spot, may be depended on as genuine; and, never having been made public before, may gratify the curiosity of the antiquary, as well as establish the credit of the history.

If the writer should at all appear to have induced any of his readers to pay a more ready attention to the wonders of the Creation, too frequently overlooked as common occurrences; or if he should by any means, through his researches, have lent an helping hand towards the enlargement of the boundaries of historical and topographical knowledge; or if he should have thrown some small light upon ancient customs and manners, and especially on those that were monastic; his purpose will be fully answered. But if he should not have been successful

in any of these his intentions, yet there remains this consolation behind—that these his pursuits, by keeping the body and mind employed, have, under Providence, contributed to much health and cheerfulness of spirits, even to old age: and, what still adds to his happiness, have led him to the knowledge of a circle of gentlemen whose intelligent communications, as they have afforded him much pleasing information, so, could he flatter himself with a continuation of them, would they ever be deemed a matter of singular satisfaction and improvement.

GIL. WHITE.

SELBORNE,
January 1st. 1788.

INTRODUCTORY CHAPTER

I

GILBERT WHITE

GILBERT WHITE was born at Selborne parsonage on July 18, 1720, in the middle of the reign of George I—the year of the South Sea Bubble, which led to Walpole's famous ministry, and the development of the Cabinet system. He was the eldest son of John White, J.P., a barrister and country gentleman, without any settled residence of his own, whose father—Gilbert White the elder—had been Vicar of Selborne nearly forty years, and was to continue so during seven more. This Gilbert, grandfather of the author of the *Natural History*, was the first White of Selborne; he had been a Fellow of Magdalen College, Oxford, which holds the living, and on settling down he married the daughter of a yeoman farmer named Luckin of Nore Hill near by. At his arrival he had found the parsonage in a miserable condition, with naked walls and a stone floor to the principal rooms and a stone-pit in the middle of the back-garden. Besides putting it in order he began a series of improvements which his descendants continued for more than a hundred years.

The family was large even in an age of large families, and it was specialized in two directions—towards business, and towards Oxford and the Church. In Gilbert White's time this second bias proved overwhelming—not only was he a parson himself but both his grandfathers, three uncles by marriage, two brothers, four nephews and countless relations and connections were also parsons. Not one of these apparently attained to even moderate distinction—they remained vicars and rectors to the end of their days. The most

famous of all never passed beyond a curacy. They were unambitious by nature, and it is more likely that they failed to rise through failing to ingratiate themselves than through any incapacity in their vocation. That was certainly the case with Gilbert White, and with a collateral ancestor, John White, who, being Bishop of Winchester on Elizabeth's accession, threw away the most glorious opportunity that English history has ever afforded a supple enough bishop by an ill-timed sermon to the effect that a live dog was better than a dead lion. Others, less attracted by tranquillity, went into commerce, like Sampson White, great-grandfather of the naturalist, who settled at Oxford and had the good fortune to be turned out of the Council as a Royalist during the Civil Wars. On the Restoration in 1660 the City chose him as an acceptable Mayor, and he succeeded in reasserting an ancient claim of his office, granted by a Charter of Henry II, to serve as butler at the Coronation, for which service he was knighted. He must have been a typical provincial mayor of his time, judging from a story cherished by his descendants that " the worthy Mayor, on hearing Lord Rochester at Court remark on the recent frequency of highway robberies, sagely observed, ' Perchance then, my lord, there be knaves abroad ! ' upon which his lordship, looking at him, replied, ' Ay, and fools too ! ' " As a successful man he bought Swan Hall near Witney, where his eldest son appears to have lived as a country gentleman ; of the others two became Fellows of Oxford colleges and a fourth Mayor of Oxford. In the time of his grandfather, therefore, the interests which Gilbert White's generation inherited—academic, clerical, and commercial —with the bias towards a country life, are already pronounced.

After the most famous one, ten more children were born to John White and Anne Holt his wife, mostly at Compton under the Hog's Back where they lived until 1727, the year of George II's accession. In that year the old Vicar died, and his widow removed to the house called " late Wake's " which her son henceforth made his home. Gilbert possibly went to school at Farnham, and certainly for a year or more to Basingstoke Grammar School ; thence

in 1740 he went up as a commoner to Oriel College, Oxford, where he read the classics, went riding, and shot snipe, until in June, 1743, he graduated B.A. On this occasion Alexander Pope presented him with an inscribed copy of his translation of the Iliad in six volumes, still extant, in which some Oxford friend happened to leave the sketches of their possessor, of which one is reproduced here and the other at the end of this chapter. Within a year he was a Fellow of Oriel, which he remained until his death fifty years later.

Oxford at this period was in an unsatisfactory condition, as we know from the pictures given not only by Gilbert White's correspondence but by the economist Adam Smith, his contemporary at Balliol, by Parson Woodforde's diary, by Gibbon's indictment, and from many other sources. Numbers were at their lowest ebb—in 1750, for instance, there were only 190 matriculations. Fellowships were virtually perquisites for the clergy, and were in the hands of an indolent, factious set of men who spent their time on punch and scandal while awaiting the decease of incumbents of the fatter college livings. Neither research nor tutorial obligations were taken very seriously. The light in which they were regarded is well shown by a letter from John Mulso to Gilbert White, written during 1758, where he says : " Fellowships are a sort of Temporary Establishment for men of good Learning and small Fortunes, till their merits or some fortunate Turn pushes them into the world and enables them to relinquish to men under the same predicament." This was considered to be the whole intention of the founders, and in practice the standard was often much lower. Thus marriage, and the accept-

ance of a living or inheritance above a certain value vacated a Fellowship, but such rules were frequently evaded, and it was not an unknown event after the death of a Fellow for a widow to materialize and demand a College pension. The minority who from time to time strove to purify the University and set a higher standard were overwhelmed by the dead-weight of vested interests and tradition. Thus Richard Newton's bold experiment at Hart Hall, which he converted into Hertford College in the year that Gilbert White first came up, was thwarted by men who afterwards did him the compliment of imitating some of his reforms. But of this minority Gilbert White was not one. The part he played was not by contemporary standards a discreditable one, but there is little more to be said for it. Except during his probationary year and 1752–3 when, though a non-resident, he successfully asserted his claim to serve the Junior Proctorship (which fell to Oriel that year), he kept only an occasional term during the earlier part of his career, and was afterwards present only for the transaction of college business. In this, to judge by his executorships and his handling of his own affairs, his advice must have been extremely useful. He showed himself scrupulous over his obligations, such as they were at the time, but curiously incalculable in his course of action, which (at a period when such calculation was the main Oxford amusement) must have proved a source of irritation, considering that he was so long the senior Fellow. Those who made the mistake of reckoning without him were chagrined when he proved not diffident about asserting his rights, and by no means disposed to second attempts at reform, which could hardly have turned out to his advantage. He was, in fact, one of the Proctors of the University during the year in which Gibbon as an undergraduate formed his unflattering opinion.

After his probationary year at Oriel was over he travelled a good deal. It is at this time that there opens a series of letters addressed to him by an Oxford friend, John Mulso (1721–91), which has lately been published, and which helps greatly to illuminate his life. Mulso had been at Winchester with the poet Collins and Joseph Warton,

both friends of Gilbert White's. Like them he went into the Church, where he spent the rest of his active life in wringing more and better benefices out of his uncle Dr. Thomas, successively Bishop of Peterborough, Salisbury and Winchester. (That this initial advantage led only to a canonry at the end of a pertinacious career helps to explain the failure of White to obtain preferment when he desired it. *Fat-goose Living* was ear-marked for the very able or the very brazen.) Mulso's sister Hester, who became " the admirable Mrs. Chapone," wrote a once celebrated book of *Letters on the Improvement of the Mind*, originally intended for the benefit of his eldest daughter.

The last Jacobite rebellion, when Bonnie Prince Charlie's Highlanders marched as far south as Derby without a finger being raised to stop them, seems to have made no difference to Gilbert White. He was called away about this time to the Isle of Ely by the death of a relative, whose affairs he spent several months in winding up. There is an extant letter of his about this business dated on the day of Culloden, just as towards the end of his life we find him cross-questioning a woman about nightjars on the day that the Bastille was stormed. In the summer of 1746 he took his M.A. degree, which at that time involved an examination, and apparently a severe one—Mulso refers to it as " the fiery ordeal." In the following spring he was ordained deacon in Christ Church, and took the curacy of Swarraton, not far from Selborne. In October, at Oxford, he had smallpox—almost the only serious illness during a long and active life. In 1746 he spent some time in Essex, South Lincolnshire, the Isle of Ely, Gloucestershire, and Oxford. In 1750 he paid a visit of several weeks to a friend who was Rector of East Allington near Kingsbridge in the South Hams of Devonshire, and in the summer of 1751 he made a long tour through " the N.W. of England," probably including part of Derbyshire, which is the farthest north he is known to have gone. Within the limits Lincoln-Derby-Shrewsbury-Gloucester-Plymouth there was not much country that he did not know, except in East Anglia. He was still an active

sportsman and did not cease to shoot regularly for some time, as the entries in his account book show—thus on September 22, 1752, "Gave Tom Ruffel for shewing me some Quails 00.00.06." He gave up the Swarraton curacy in March, 1749, and on October 25, 1751, became Curate-in-charge at Selborne. Only five months later he resigned in order to become Junior Proctor at Oxford. Having served his term he went out of residence again and took up a curacy at Durley; during the eighteen months he held it the expenses exceeded the receipts by nearly twenty pounds. In the spring of 1755 he became curate of West Dene near Salisbury—a living which belonged to Edmund Yalden, Vicar of Newton Valence near Selborne, whose daughter had lately married Gilbert's brother Benjamin. Later he took over the curacy of Newton also, and soon afterwards of Selborne for the second time. At the age of 36 he was still single and still unsettled, not from choice but from circumstances and want of the energy to mould them. Ever since he was seven Selborne had been his home, but he had not lived there continuously; he had been absent for long intervals first at school, then at Oxford, and on visits and tours or serving distant curacies. His mother had died just before he went up to Oxford; of his brothers, Thomas, the next eldest, had gone into business in Thames Street and in 1758 married the widow of his senior partner, William Yalden, another child of the Vicar of Newton Valence. Benjamin, five years younger than Gilbert, had similarly gone into partnership with a connection by marriage as a publisher and bookseller in Fleet Street. He specialized with success in Natural History, which was just becoming a popular subject, and eventually published *Selborne*. John, born in 1727, after sowing wild oats on a considerable scale, took orders in 1753 and three years later went out to Gibraltar as garrison chaplain. Anne, one of the two sisters who grew up, was married by this time and had two children. Grandmother Rebecca, the widow of Gilbert White the elder, had died in 1755 at the age of 91, and John White was getting on for seventy. Thus the family at the Wakes was very much reduced. Gilbert,

as the eldest son of an eldest son and the heir to a large number of well-to-do relations, seemed on the verge of stepping into a pleasant inheritance at Selborne and seeing all his ambitions realized. Undoubtedly he desired no more than to live the life of a country gentleman in his own parish. In 1751 he had begun keeping a diary of events in the garden. He was not at this time particularly absorbed in natural history. Certainly there is a note of his extant on the first appearance of the cuckoo for 1756, when he was only fifteen. But the passion which an Oxford contemporary pleasantly lampooned was for gardening, not for nature, and that long remained his primary interest. The keeping of a journal was very likely suggested by Dr. Stephen Hales, a scientist of fertile resource and his neighbour for part of the year at Faringdon Rectory, who was certainly responsible for persuading Robert Marsham to do the same. This *Garden Kalendar* must have considerably increased his attachment to Selborne, where he was constantly planting, ornamenting and making small improvements. Thus in April, 1753, he planted two silver and one Scotch fir in the upper end of the Ewel-Close, and in the same year—the year of his Proctorship—he helped his brother John to construct the well-known Zig-zag to the top of Selborne Hanger. But by 1756 the dream of independence and a home at Selborne was beginning to fade. As John Mulso ruefully observed at this time, after waiting ten years to be married: "Do not fix your eye . . . upon anything in particular; for the fixt eye will be an aking one, believe me. I have looked at Peterboro' [where he had been promised the next vacant prebend] til it now seems lost in a mist." Probably about the same time, Gilbert White, who was in much the same position, came to the same conclusion. The expectation of succeeding at Selborne had prevented him from seeking a benefice; he had accepted such temporary curacies as he could serve without permanently committing himself, and without vacating his Fellowship. For this same reason he was unable to marry, as he would almost certainly otherwise have done. The story that he was the victim of an unrequited passion for Mulso's sister 'Hecky' has been

shown to be ludicrously ill-founded; in fact it seems clear from the correspondence that she and her family would have annexed him if he had given her the slightest chance. She did not become engaged to Chapone (a friend of Richardson the novelist) until 1757, when she was thirty years old, and her married life lasted only ten months. Her attraction seems to have consisted principally in her mind; Wraxall, who knew her in her later years, candidly remarks that "under one of the most repulsive exteriors that any woman ever possessed she concealed very superior attainments and extensive knowledge." Charlotte Anne Burney, sister of Madame d'Arblay, who met her at the Dean of Winchester's when she was just over fifty, records that she "looked less forbidding than usual; but she is deadly ugly to be sure; such African nose and lips, and such a clunch figure! 'Poor Chappy she's so ugly you know!' Mr. Seward says."

The nature of his income left Gilbert White the choice between marriage and Selborne, although the fact did not become clear until half his life was spent. At this critical period came the events which determined the remainder of it. The college living of Moreton Pinkney in Northamptonshire, which was not valuable enough to vacate a Fellowship, fell vacant, and was at his option as senior Fellow. Very soon afterwards (Jan. 14, 1757) the Provost of Oriel died, and Gilbert White, having held the office of Dean four years before, resolved, with some hesitation apparently, to become a candidate. He was defeated by Chardin Musgrave in a contest which left considerable ill feeling. Either from prejudice, or more likely from a genuine desire for reform, Musgrave tried to insist that whoever took Moreton Pinkney should serve it in person, which Gilbert White was unwilling to do, while a junior claimant was prepared to. After a certain amount of friction the living was given to White, as the Provost's private memorandum book states "to avoid any possibility of a misconception of partiality" since a majority of the Governing Body had just voted against him over the Provostship. But it was laid down that in future cases of this sort any

Fellow who would undertake the cure should have precedence over a senior proposing to put in a deputy. Such conditions had never been imposed before, but they were certainly proper ones, and Gilbert White, in addition to missing the Provostship, was placed in the position of a self-seeking opponent of reform. Musgrave, by refusing to give way, would similarly have incurred the imputation of abusing his majority to reward his supporters against an opponent with a stronger claim. Yet there is no doubt that White was guilty of nothing worse than tactical unwisdom ; he has gone down to history, as Mulso said he would, as a man who refused livings and served curacies, not out of pure altruism, but because of his reluctance to live at any place except Selborne, which was a close preserve of Magdalen, and could never be at his disposal. The next year (1758) died Dr. Bristowe the vicar, and during fourteen months Gilbert White served the curacy of his native village, for the third time. In the same year, on Michaelmas day, John White died also, and the state of his affairs made it obvious that his heir had not much to hope for. Deductions on behalf of his numerous younger children swallowed up a great part of the comparatively small and scattered estate. To make things worse the world, and particularly the College, at once assumed that Gilbert White had become a wealthy man. Tender consciences sprang up in the most unexpected quarters when it was known that he did not intend to resign, and much scandal was evidently passed round. There is extant the draft of an explanatory statement (not printed in the *Life and Letters*) sent by him about November, 1758, to justify the retention of his Fellowship, and in the course of this he says :

" The words of the statute are general . . . *uberius beneficium*. . . . As to the freehold Patrimony to which I am entitled by my Father's decease I am very certain that the clear yearly income, upon which I can depend from it, will fall short of the sum above supposed compatible by ye Visitor's determination [£66.13.4.]. In Merton Coll: and in New Coll: if I am not misinformed, the tenable patrimony under a similar expression has been reckoned at £80.

And I am certain that the income arising from my freehold-land will fall considerably short of what I am entitled to receive in virtue of my Fellowship.

The method of Oriel Coll: hitherto has been to proceed with favour in construing the Visitor's Injunction.

No Visitor's Injunction has yet expressly been given in the Case of patrimony. If the Coll: thinks right to extend the Visitor's Injunction I can never suppose them ready to extend it entirely to the disadvantage of any of their members."

This confirms what Mr. Rashleigh Holt-White had already shown good reason to believe, that Gilbert White's retention of his Fellowship was perfectly open and justified, and that writers who have accused him of relying on the maxim that anything can be held by a man who can hold his tongue are merely repeating baseless slanders circulated by his enemies at the time. His assurances were accepted as a matter of course, and the Provost, sounded on the subject by Mulso, who met him in St. James's Park soon afterwards, remarked that it lay with him to keep or leave the Fellowship, for nobody meant to turn him out if he did not choose it himself. He spent the following winter in Rutlandshire and in London, but from this time on his life was set in its mould. Gradually all idea of marriage was abandoned, while his interest in natural history and attachment to Selborne grew steadily stronger. At Michaelmas, 1761, he took up the curacy of the adjoining parish of Faringdon, and served it for a quarter of a century. It was apparently only on the death of his uncle by marriage, Charles White, that the Wakes actually became his property, and at the same time he applied for his uncle's benefice, which was refused him by the gouty and formidable Lord Chancellor Henley, who held it in his private patronage. This rebuff, which occurred in spite of the intercession of the Bishop of Winchester (who, like Henley, had known the candidate a long time), turned out to be due to the " lingering, cold, and disobliging manner " in which Gilbert White had voted for the Bishop of Durham in a contest over the Chancellorship of the University thirteen years before, thereby offending the patron's pride. Such incidents may help to explain why White's political allusions are so rare that he is often wrongly suspected of having taken no interest in affairs at all.

There were many visitors at Selborne this summer, and one of them, Miss Catharine Battie, who was nineteen at the time, left a naïve and delightful account of the way in which their days were spent, printed in full in the *Life and Letters*. Gilbert White took his full share in the entertainment, and she kept among other things an amusing note of his concerning the payment of a bet :

> Madam,—I make a point of paying my debts of Honour as soon as possible ; but at the same time can't help remarking that it was not a fair wager. For it is plain, by some art magic best known to yourself, you have not only a power of detaining men that ought to be going ; but also of keeping those away that ought to come. In the whole it is best that I have been the loser, as it would not be safe in all appearance to receive even so much as a pin from your Hands.—I am, with many a x x x x x x x and many a Paternoster and Ave Maria,
>
> GIL. WHITE.

In August, 1765, the *Garden Kalendar* becomes a *Calendar of Flora and the Garden* ; and in 1768 it takes final shape in a substantial bound volume with ruled columns, designed for the purpose * and called *The Naturalist's Journal*. About the same time he formed friendships with several well-known naturalists who did much to stimulate his interest in natural history. Of these the two who had most influence upon him were Thomas Pennant (1726–98) of Downing in Flintshire, with whom he began to correspond on August 10, 1767, and the Hon. Daines Barrington (1727–1800), whom he had met in London in May, 1769. To them the nucleus of the *Natural History of Selborne* was addressed in the form of ordinary private correspondence during the next fourteen years, and to their encouragement its publication was chiefly due. Pennant, who was a wealthy man and a persistent traveller, had just been elected F.R.S. As a writer he had a prolific output: his various *Tours* and his *British Zoology* were among the best sellers of the day. He used the correspondence with White purely in order to extract from him as much material as possible for future editions of the *British Zoology*, setting him to observe upon all sorts of dubious points outside the scope of his

* By Daines Barrington.

own hasty and superficial field studies. Gilbert White willingly took up the part thus allotted to him, which served to improve the quality and extent of his observations as nothing else could have done. Confronted with definite problems and stimulated by correspondence he rapidly became a naturalist, and the degree to which Pennant exploited him was undoubtedly a main cause of this development. Barrington, who was Recorder of Bristol, simultaneously conducted the other side of his education by a continuous stream of questions, sometimes fantastic, sometimes suggestive, on the more theoretical aspects of Natural History. "You are one of those few naturalists," he wrote to White, "who not only observe but think." He likewise drew upon White's communications in print, particularly in his *Miscellanies*, and once proposed that they should collaborate, which his correspondent had more sense than to do. Already by 1771 both Pennant and Barrington had suggested publication, and in the circumstances it was inevitable that Gilbert White should be tempted to appear as an author on his own account. This he was not altogether unwilling to risk. He wrote to Barrington [1] on February 12, 1771, in the original of Letter IX:

"In obedience to yr. repeated injunctions I have begun to throw my thoughts into a little order that I may reduce them into the form of an *annus-historico-naturalis* comprizing the nat. history of my native place. As I never dreamed 'til very lately of composing anything of this sort for the public inspection, I enter on the business with great diffidence, suspecting that my observations will be deemed too minute and trifling. However if I ever finish it I shall submit it to yr. better judgment. . . ."

On July 19 he writes to Pennant also, in the original of Letter XXXV:

"As to any publication in this way of my own, I look upon it with great diffidence, finding that I ought to have begun it twenty years ago. But if I was to attempt anything it would be somewhat of a Nat: history of my native

[1] Nearly a year before he had written to him, saying: "It is no small undertaking for a man unsupported and alone to enter upon a natural history from his own remarks!"

parish, an *annus historico-naturalis* comprizing a journal for one whole year, and illustrated with large notes and observations. Such a beginning might induce more able naturalists to write the history of various districts, and might in time occasion the production of a work so much to be wished for, a full and compleat nat: history of these kingdoms. . . ."

There seems to have been no idea at this stage of publishing in the form of letters, as was eventually done. It is perhaps significant that Pennant is neither informed that the work is actually in hand nor promised an opportunity of giving an opinion on it. That he seriously wanted White to publish is most improbable, and no work submitted to him in MS. could be depended on to contain *anecdotes* in the contemporary sense of something hitherto unpublished unless its appearance followed exceedingly soon. Gilbert White's low opinion of the value of his own observations was gradually overcome by personal contact with the famous naturalists of his time, whose faults, little noticed by the world, stood out sharply in the clearer Selborne atmosphere. The compliments of his correspondents, who could well afford them, and the reception given to his papers on the *Hirundines* read before the Royal Society in February and March, 1774, finally removed his hesitation. About that date the entries in the *Naturalist's Journal* assume a much ampler form, and the idea of the *Natural History* begins to take shape. In a letter of March 29, 1774, to his brother John he says, " As to my letters they lie in my cupboard very snug. If you will correct them and assist in the arrangement of my journal I will publish," and a month later the proposal is repeated in more detail—it is noteworthy that he now speaks of including " the Natural History of this district " and not of Selborne parish alone. But his procrastination had still to be reckoned with and the part of the work still unwritten took fifteen years to complete. John, who had only turned naturalist at Gibraltar under the persuasion of his brother and of Pennant, was much less dilatory, and his *Fauna Calpensis*, or Natural History of Gibraltar, had reached an advanced stage by 1776, though it was never actually published.

It is generally supposed that Gilbert White lived at Selborne almost as a hermit; nothing could be further from the truth. His sociable nature rebelled against solitude, and when the infamous roads or other reasons prevented his friends and relations from visiting him he set forth to visit them wherever they were to be found. He suffered so much from coach-sickness that he preferred to ride whenever he could. The frequency of his expeditions and visits is bewildering; Mulso, who often lost track of his wanderings, felt a temptation to address him "Stay, Traveller!" in the formula of an epitaph. Some idea of these wanderings may be given by a brief list for the years 1768–70, when he turned fifty:

1768. January at Selborne; Feb. 1–10 London; Feb. 11–13 Oxford; Feb. 13–May 3 Selborne; May 3–14 London; May 14–July 2 Selborne; July 3–15 Fyfield; July 16 Bradley; July 16–Oct. 13 Selborne; Oct. 13–22 Oxford; Oct. 22–Dec. 31 Selborne.

1769. Jan. 1–8 Selborne; Jan. 9–28 Fyfield; Jan. 28–Mar. 28 Selborne; March 28–31 Oxfordshire; March 31–April 4 Witney; April 5–8 Oxford; April 8–24 Selborne; April 25–May 13 London; May 13–June 23 Selborne; June 24–July 10 Newton Valence; July 10 Whitchurch; July 11–13 Oxford; July 14 Whitchurch; July 15–27 Newton Valence; July 27–September 13 Selborne; Sept. 13–30 Ringmer, nr. Lewes; Sept. 30–Dec. 31 Selborne.

1770. Jan. 1–6 Bradley; Jan. 6–Feb. 5 Selborne; Feb. 5–13 Fyfield; Feb. 13–15 Charlton, Wilts; Feb. 15–17 Fyfield; Feb. 17–Mar. 19 Selborne; March 19–21 Bradley; March 21–April 15 Selborne; April 16 Whitchurch; April 17 Oxfordshire; April 18–22 Oxford; April 22–May 1 Witney; May 2–5 Oxford; May 5–June 10 Selborne; June 11–23 London; June 24–26 Selborne; June 26–July 7 Fyfield; July 7–Sept. 9 Selborne; Sept. 10–13 Farnham Castle; Sept. 14–18 Selborne; Sept. 18–22 Fyfield; Sept. 22–Oct. 1 Selborne; Oct. 2–4 Chilgrove; Oct. 4–18 Ringmer; Oct. 18–19 Chilgrove; Oct. 20–Dec. 31 Selborne.

The following year there were four visits to Bradley; three to Fyfield; three to Winchester; two to Ringmer; two to Chilgrove; one to Newton; one to Bramshot, and one to Funtington. Some of these places were fairly close; others such as Fyfield, Ringmer, London and Oxford at a considerable distance, involving a full day

of hard travelling and sometimes more. In the age when the Flying Coach advertised that " However incredible it may appear this coach will actually (barring accidents) arrive in London in four days and a half after leaving Manchester," this is hardly to be described as a sedentary life.

Gilbert White continued an " hussar parson " even when he was an old man, but he gave up exploring fresh country. The places named were almost all the homes of friends or relations; Fyfield of Brother Henry, London of Brothers Benjamin and Thomas, Witney of John Mulso; Newton Valence of Rev. Richard Yalden and Ringmer of his aunt Rebecca Snooke.

The years when *Selborne* was slowly coming into being passed not in retirement, but in constant activity of the trivial kinds in which the eighteenth century delighted. There was much to amuse and occupy the mind, but nothing to challenge or wrestle over. (He actually advises John in 1776 to relax a little and says: " Particularly, I think, you should avoid contention, though in ever so good a cause; for any earnest agitation of the mind is bad for the stomach and bowels.") In April, 1784, died Andrew Etty, vicar of Selborne; his successor did not reside, and Gilbert White was therefore able to give up the Faringdon curacy and take Selborne again.

He was becoming, and beginning to look upon himself as, an old man. In September, 1780, he constructed the gently sloping Bostal up the Hanger to save the more strenuous climb up the Zig-zag. Two years later he began to count his nephews (17) and nieces (15) in the *Naturalist's Journal*. (Nine years afterwards the total had risen to 58.) His contemporaries were beginning to die off. After Mr. Etty, who had been a close friend, he suffered an equal loss in 1785 through the death of the Rev. Richard Yalden, vicar of Newton Valence; his brother John had died in 1780 and Henry in December, 1788, soon after receiving a copy of the *Natural History*, which had just been published.

The ground had been well prepared for it and it met with a good reception. The important review in the *Gentleman's Magazine*

was ably written by the author's brother Thomas, and other critics proved as friendly as if they had been as closely related to him. It was a success from the beginning, and its value was appraised by intelligent people at the time with surprisingly good judgment. The general opinion of it has changed very little during the hundred and fifty years since it appeared.

Gilbert White found himself celebrated, and seems to have enjoyed it. He attracted new friends and fresh correspondents. Colonel George Montagu, who was about to lay the foundations of modern British ornithology, addressed him some formidable screeds. He exchanged with Robert Marsham of Stratton a series of letters which showed some marks of age but no decay of vitality. He visited Oxford for the last time in April, 1792, having seen the slight friction which he had once experienced at Oriel long since smoothed away, and now replaced by admiration. Towards the end of his seventy-third year, about June 16, 1793, he became seriously ill, and on 26th he died. He was buried in Selborne Churchyard, as he had desired, in a simple grave near the chancel wall with a head-stone bearing only the initials G. W. and the date, 26 June, 1793. Within a generation it was neglected and forgotten ; the parish clerk about 1830 was unable to tell a visitor where to find it. It has since been better looked after, without any violence to its original simplicity.

Selborne is the work of a lifetime. It has the fine compression and vitality which can only be given to facts after long study and speculation by a vigorous, original mind. It has, at the same time, a notable restraint ; the author is on his guard against betraying the enthusiasm he frequently feels. He does not believe in enthusiasm, and in any case an enthusiasm for the habits of birds and beasts would look ridiculous on the eve of the French Revolution. Nor does he ever strike out at anyone, however strongly he disagrees with them, or however temptingly vulnerable their arguments appear. To read the *Natural History*, and then to go through his private letters on the same subjects, or even the original letters to Pennant

and Barrington, is an education in restraint. Exclamations, personal comments, irrelevancies, humorous remarks, and anything approaching sarcasm are ruthlessly extirpated. The trivial and personal elements are sacrificed to an atmosphere of serenity. This restraint has much to do with the success of the *Natural History*. It is a work of art, not all of the same merit but all in the same pattern. It includes nothing incongruous to break the spell of the imaginary world it creates. For Gilbert White's world is imaginary. It is not Nature. It is the finest and broadest and the most enduring bridge that can be built between Nature and civilization; it has elements of both, but it is in the last resort true to neither. It is perhaps the nearest approach to Nature which can be universally understood; it opens a world which is not a human world, but still is ordered where Nature is unkempt, polished and serene, where Nature is ebullient, and individually aware where Nature is collectively blind. *Selborne* is commonly taken to be an artless and spontaneous composition; actually it was shaped with as much labour as any other work of art of equal importance. Passages were re-written and re-written again before the final form was attained. Sometimes, undoubtedly, the result is more formal and by modern standards inferior to the original version, but even where I felt this most strongly I have never ventured to interfere with the text which the author took so many years to arrive at. He would have given small thanks to a modern editor who, under pretence of faithfulness to the original manuscript, threw back the letters into their original crude state. A couple of parallel passages will serve to show the nature of the overhauling which took place:

Original Version	Final Version
(Letter to Samuel Barker, Nov. 23, 1780)	(*Natural History of Selborne*—Letter XL to Pennant)
"All I know about the sleep of fishes is, that at the Black-Bear-inn in Reading there is a stream in the garden which runs under the stables, and so	"In the garden of the Black Bear Inn in the town of Reading is a stream or canal running under the stables and out into the fields on the other side

under the road into the meadows; it is a branch of the Kennet. Now this water all the summer is full of carps, which roll about, and are fed by travellers, who divert themselves by tossing them crumbs of bread. When the cold weather comes, these fishes withdraw under the *stables*, and are invisible for months; during which period, I conclude, they must sleep. Thus the inhabitants of the *water*, as well as of the *air* and the *earth*, retire from the severity of winter."

(MS. of *Naturalist's Journal* under December 2, 1769)

" In a dry chalky field far removed from any water was a water-rat plowed out which had formed for itself an hybernaculum cunningly constructed of leaves and grass. In one end of its burrow were piled up more than a gallon of potatoes. Was this amphibious animal determined in the choice of its place by the potatoes growing there; or does the water-rat habitually forsake the water-side during the colder months of winter?"

of the road; in this water are many carps, which lie rolling about in sight, being fed by travellers, who amuse themselves by tossing them bread; but as soon as the weather grows at all severe these fishes are no longer seen, because they retire under the stables, where they remain till the return of spring. Do they lie in a torpid state? if they do not how are they supported."

(*Natural History of Selborne*—Letter XXVI to Pennant)

" As a neighbour was lately ploughing in a dry chalky field, far removed from any water, he turned out a water-rat, that was curiously laid up in an hybernaculum artificially formed of grass and leaves. At one end of the burrow lay above a gallon of potatoes regularly stowed, on which it was to have supported itself for the winter. But the difficulty with me is how this *amphibius mus* came to fix its winter station at such a distance from the water. Was it determined in its choice of that place by the mere accident of finding the potatoes which were planted there; or is it the constant practice of the aquatic rat to forsake the neighbourhood of the water in the colder months?"

This revision, it is to be noted, was done from a literary point of view. In other respects it was poor. Repetitions of the same word in one sentence were eliminated; repetitions of the same

material were not. There were also some loose ends left. In the original MS. of Letter V to Barrington he mentions having seen some aberdavines (siskins) to which he refers again at some length on Dec. 20, 1770, in the original of Letter VIII. A year afterwards (Nov. 28, 1771) he discovered that these were really reed-buntings. In revision he struck out the error from Letter V, but altered Letter VIII to read: "The birds that I took for aberdavines were reed-sparrows (*Passeres torquati*)," apparently overlooking the fact that the revised version contained no previous allusion to them. Dates were frequently changed. Thus the actual first letter to Pennant (Letter X) was dated August 10, not August 4; Letter XII was dated November 6, not 4; Letter XIV May 14, not 12, XV, which bears the fictitious date of March 30, was part of the same; XVII was dated June 16, not 18, and the first sentence has been altered from "Last night arrived your agreeable letter . . ." to "On Wednesday last . . .;" XVIII was dated July 25, not 27; XXV September 1, not August 30; XXXII, dated October 29, 1770, contains only a few lines from a real letter of that date and is mostly part of XXXI; XXXV, dated simply "Selborne 1771", is part of a letter of July 19 and XXXVI belongs actually to September 25 of the same year. In between these curiously unsystematic alterations, which baffle any theory to account for them, are letters bearing their proper superscriptions. Letter XL to Pennant presents a mystery of a different sort. The extant MS. correspondence with both Pennant and Barrington contains a letter dated July 8, 1773, identical in both series except for a trivial P.S. Both these are by an amanuensis, presumably Gilbert White's nephew Jack, and neither seems to have been through the post, as many of the others obviously have. The first part of this letter, describing the whitethroat, blackcap, redstart and flycatcher, is printed towards the end of the made-up letter XL to Pennant (ostensibly of September 2, 1774); the rest forms Letter XV to Barrington and is properly dated. It looks as if the author originally economized his labour by sending the same letter on the same day to both his correspondents,

and solved the difficulties arising later by dividing it between them for publication. (There would have been nothing extraordinary in this; the device of a single letter for two people was one he undoubtedly used. Thus a letter about Blanchard's balloon was sent to at least two correspondents and also printed in some newspaper. Five of his sermons sold in 1896 were said to have been preached on an average about thirty times each; No. 99 was delivered on thirty-eight occasions between April, 1748 and 1792, of which nine were at Selborne and fourteen at Faringdon.) It is interesting to notice that the famous description of the blackcap's sub-song, " . . . but when that bird sits calmly and engages in song in earnest, he pours forth very sweet but inward melody, and expresses great variety of soft and gentle modulations, superior perhaps to any of our birds, the nightingale excepted "—was originally applied to the whitethroat. Another passage of the composite letter XL occurs, as has already been shown, in one to his nephew Samuel Barker.

The *Natural History* consists ostensibly of forty-four Letters to Pennant and sixty-six to Barrington. Of these many bear definite dates; others are undated and are simply essays written to cover the rest of the ground, after publication had been decided on. But, as we have seen, even the dated letters bear no close relation to the correspondence that originally passed. Several of the real letters are suppressed as trivial or irrelevant; the dates of others are altered for no apparent reason by anything from a day to a week (in one case a year); some are divided into two or three, others fused together without regard for chronological sequence or even the correspondent addressed. Amendments are often extensive and affect questions of fact as well as of style. The treatment is occasionally so free as to approach the licence of Barbellion's Journal, which describes storms on days that were actually fine and air raids months before they began. As a parish history it makes no pretence at adequacy. A considerable number of the hundred and twenty odd species stated to have been recorded in the parish are not mentioned at all, and the records of many others occur quite incidentally without any

clue to their status. But for the diaries, our knowledge of the fauna of Selborne during the eighteenth century would be very meagre indeed. Many of the most striking occurrences are entirely ignored. For example, about January 14, 1774, three bitterns were shot in different parts of Selborne parish, one of them actually by the Hanger, and on December 3 of the same year a scarce merganser was shot with a tench in its bill on a pond close to the village. Neither of these was mentioned. The swallow-tail butterfly sometimes occurred at Selborne, even in the garden of the Wakes, as on August 2, 1780, July 14, 1781, and August 18, 1782. Gilbert White was well aware of the abnormality of these records, but *Selborne* says nothing of them, nor of the Pale Clouded Yellow (*Colias hyale*) which was noted with an exclamation mark on September 4, 1769. The material provided by the *Naturalist's Journal* was insufficiently drawn upon in other directions also. For instance the footnote to Letter XXVI to Pennant states that the author has never seen a large bat (noctule), after July, but it comes out freely in September, and we find from the *Journal* that he had in fact seen one as late as September 30 in 1771.

These discrepancies, omissions, and apparently irrational alterations, seem hardly capable of any single explanation. Gilbert White was physically and mentally unfitted for applying himself to writing for any length of time. He needed an amanuensis. He was evidently easily distracted; he excuses himself for not sending an account of a cobweb shower because "this house is so full that I have no opportunity of being long enough alone to think accurately on any subject." The proposal for a Natural History having arisen out of the correspondence with Pennant and Barrington it was the simplest plan merely to edit existing material, adding what seemed necessary, instead of taking the trouble to remould it into a continuous book. By following this line of least resistance he also disarmed the criticism which might have confronted a more pretentious work, and at the same time was able to shelter himself behind the then powerful names of Barrington and Pennant. This plan had the further merit

of enabling him to use as it stood a great deal of valuable material which those correspondents had already availed themselves of, and which could hardly have been republished without apology in any other form. It not only excused repetitions but naturally provoked comparisons between the two famous naturalists and their humble correspondent which could hardly turn out to their advantage. The arguments for the informal plan were therefore overwhelming. Gilbert White's procrastinating habits stamped themselves upon the *Natural History*; it has the disjointedness and the impressive reserve of information of a book which has been considered much longer than it need have been. It is a small and rather haphazard selection from an enormous work comprehending all the Natural History of Selborne which existed in embryo within the bulky MSS. of the *Garden Kalendar* and the *Naturalist's Journal*, but had never been digested, or given literary form.

Two of Gilbert White's brothers at various times planned similar works, John on Gibraltar, Thomas on Hampshire, and in his advice to them we see pretty clearly what his guiding ideas were. He was above all anxious to avoid being tedious; to temper statistics with observations, and facts with anecdotes, and to humour his readers in their temporary revulsion against Linnean nomenclature. He regarded the plates as of great importance, and saw that no expense was spared on the production. His more fundamental aims are by no means as clear. He cannot have imagined that the book he laid before the public as his idea of parochial history had any great merits in that direction. Far too much was sacrificed to the audience and to art; to his own knowledge it was exceedingly incomplete, and in local matters not always accurate. Thus the original MS. of Letter XV to Pennant states that "A shepherd saw a milk-white lark on a down above my house this winter"; years afterwards the repetition of such occurrences, invariably in mid-winter, led him to suspect that this was a snow-bunting and he altered it to read "A shepherd saw, as he thought, some white larks on a down above my house this winter; were not these the . . . snowflake of the

Brit. Zool." From a literary standpoint the amendment is trivial, but even in the eighteenth century to change one snow-bunting seen at a given time and place into several was going rather a long way for purposes of local records. Similarly he informs Pennant in Letter XXXIX of the *Natural History* that he "saw young teals taken alive in the ponds of Wolmer forest in the beginning of July last, along with flappers or young wild ducks; this date is about a fortnight out, since the *Naturalist's Journal* gives June 20 and is confirmed by a letter to John White of June 26, 1773. Tested by the sworn evidence of the contemporary Report on Woods and Forests his account of Wolmer is open to criticism. Inaccuracies like these would have been serious faults in a parish history. The studied indifference to such points in *Selborne*, though perhaps partly attributable to old age, was not at all in keeping with Gilbert White's meticulous habits, and suggests that except in the case of the *Antiquities* he did not take this aspect of the work very seriously. The stress was on the Natural History, not on Selborne. He was concerned to show how interesting and how widely useful the subject might become, how much could be done by amateurs to further and even to correct the work of more pretentious naturalists, and what infinite fields for research lay beyond the monotonous business of classification. He discovered few facts and fewer species, but he was the first discoverer of Nature. His civilized and leisurely mind refused to concern itself with her subversive and inhuman spirit, but as far as his caution let him venture towards her heart he saw with clear vision and in recording proved a masterly interpreter. Under the thin disguise of a parish historian he dealt a fatal blow to the limited contemporary view of Natural History—"to observe with care and describe with accuracy the various objects of the Universe," as the *Encyclopædia Britannica* expressed it at the time. He was the first herald of the dynamic view of Nature, and from the time that *Selborne* appeared the ancient static system was doomed. His influence upon naturalists was immediate, fundamental, and enduring.

He touches on worlds which have still to be explored. Territory

in bird life and the problems of bird population interested him more than they interested anyone else until the present century. The riddle of migration absorbed him, though he never pretended to have solved it. No part of his researches has been so much or so unfairly criticized as his inquiry into the hibernation of swallows. It is necessary in the first place to realize that there were in his time so many apparently authentic records of torpid birds found in winter that belief in hibernation, at least of a few of them, was very widely held. It was held, moreover, not merely by ignorant people and amateurs, but by some of the most eminent authorities of the age. Linnæus himself believed in it, and in 1768, the great year of the Letters to Pennant, Dr. Johnson laid it down that " Swallows certainly sleep all the winter. A number of them conglobulate together by flying round and round, and then all in a heap throw themselves under water and lye in the bed of a river." He mentioned nevertheless that woodcock migrated; Goldsmith told Boswell: " There is a partial migration of swallows; the stronger ones migrate, the others do not." The *Naturalist's Journal*, the stock nature diary of the period, was arranged in columns for the parallel recording of different classes of natural phenomena. Each was headed by an example of what should be noted; the specimen for Miscellaneous Observations reads, " Swallows were found in a torpid state in —— cliff on the sea-coast." The Third Edition of the *Encyclopædia Britannica*, although strongly inclining to the view that migration alone accounted for the disappearance in winter, still considered it necessary to give the contrary view in most careful detail and to leave the matter open. Quotation from this review of the evidence will best revive the contemporary atmosphere: " Concerning this bird [the swallow] one curious question, however, still remains to be discussed, What becomes of it in the winter? Upon this subject, there are three opinions. Some say that it migrates to a warmer climate; some, that it retires to hollow trees and caverns, where it lies in a torpid state; and others have affirmed it lies in the same state in the bottom of lakes and under the ice. The first opinion

is supported by Massigli, Ray, Willoughby, Catesby, Réaumur, Buffon, etc. The first and second opinion are both adopted by Pennant, Adanson and White. The third is sanctioned by Schaeffer, Hevelius, Derham, Klein, Ellis, Linnæus, Kalm; and the second and the third have been strongly defended by the Honourable Daines Barrington." It is a striking fact that not only are as many authorities thus cited against migration as for it, but that the majority of the latter are very out-of-date seventeenth-century men, while all the contemporary north Europeans—the people most concerned—are more or less committed to hibernation. "Though we cannot help giving a preference to the opinion which appears most probable, yet we do not think that any one of them is established upon such evidence as so serious a subject requires and as the advanced state of natural history would lead us to expect. We shall therefore state the arguments upon which each opinion is founded as fairly and distinctly as we can, and as often as possible in the very words of their respective advocates." The discussion which follows throws a vivid light on the state of knowledge at the time—this is in 1797, eight years after Gilbert White's book was published and four after his death. It is too long to quote, filling nearly seven columns, but a summary must be attempted. The argument for migration is first discussed, "Mr. White, the ingenious historian of Selborne," being invoked as a witness of it. Only three other scraps of evidence are put forward, two relating to birds coming on board ship. There are twice as many instances of torpid birds, not including two swifts accepted in a different article. Lord Belhaven had testified to the finding of swallows in old dry walls and in sandhills near his seat in East Lothian" not once only, but from year to year; and when they were exposed to the warmth of a fire they revived. Amongst other cases was that of a cliff near Whitby, "where, on digging out a fox, whole bushels of swallows were found in a torpid condition," while "the reverend Mr. Conway, of Sychton, Flintshire," reported that "a few years ago, on looking down a lead mine in that county, he observed numbers of swallows clinging to the timbers of the shaft,

seemingly asleep; and on flinging some gravel on them they just moved, but never attempted to fly or change their place; this was between All Saints and Christmas." The evidence for their sleeping under water was the most abundant of all. "Dr. Wallerius, the celebrated Swedish chemist," supplies the valuable information "that he has seen, more than once, swallows assembling on a reed, till they were all immersed and went to the bottom; this being preceded by a dirge of a quarter of an hour's length." The mother of the Countess Lehndorf said that she had seen a bushel of swallows brought from the Frishe-Haff (a lagoon by the Baltic) which, when brought into a moderately warm room, revived and fluttered about. "Count Schlieben gave an instrument on stamped paper" to the effect that swallows had been caught in a net by fishing in his lake in winter, and one of them, which was revived in his hand, flew about the room. A high official at another place gave a similar affidavit from personal knowledge; various master fishermen corroborated; and the traveller Kalm, who investigated the subject, had twice fished up swallows from under the ice. He concluded that "The swallows in Spain, Italy, France and perhaps some from England remove to warm climates; some English ones, and some in Germany and other mild countries, retire into cliffs and holes in rocks, and remain there in a torpid state. In the colder northern countries the swallows immerse in the sea, in lakes and rivers; and remain in a torpid state, under ice, during winter. There are still some objections to this latter assertion, which we must remove." And this he very ably proceeds to do.

Buffon, the great French naturalist, stored some swallows in an ice-house, and John Hunter one September "prepared a room, with every accommodation and convenience which he could contrive to serve as a dormitory for swallows, if they were disposed to sleep in winter. He placed in the centre a large tub of water, with twigs and reeds, etc., which reached to the bottom. In the corners of the room he contrived artificial caverns and holes, into which they might retire; and he laid on the floor, or suspended in the air, different

lengths of old wooden pipes . . . he then engaged some watermen to take by night a large quantity of the swallows that hang upon the reeds in the Thames about the time of their departure. They brought him, in a hamper, a considerable number ; and had so nicely hit the time of their capture, that on the very day following there were none to be seen."

The experiment, as the *Encyclopædia* remarks, was ingenious but not conclusive, for submarine dormitories were not alleged to exist except in the colder parts of Europe. This lengthy account is necessary to bring out three points : the apparent balance of testimony on either side, the conflict of opinion amongst the leading scientists of the day, and the reasonableness of Gilbert White's standpoint if only it is considered with regard to all the circumstances. For Gilbert White definitely believed in migration ; he did not regard hibernation as proved, but when it was so often alleged by responsible people and appeared in some respects so plausible, he felt bound to try and investigate it, which he never ceased to do. The question was still unsettled and he approached it in the only scientific way to approach unsettled questions, with an open mind, anxious to obtain and sift evidence wherever it leads. He was too good an observer not to realize that he had personally failed to meet with a scrap of real proof ; he never gave up believing that he might. It would be possible to quote him extensively on either side ; certainly towards the end of his life the idea of hibernation seems to have gained ground in his mind, but neither ever captured it entirely. It was only by such work that the question was finally settled. Even Montagu, of the following period, who firmly maintained the universality of migration, freely admitted that wounded or diseased birds might occasionally lie torpid. There was no obvious reason why they should not ; it was no fabulous power, mammals, reptiles and insects were known beyond doubt to possess it.

It is only very lately that the true facts of the swallows' migration have begun to be proved. Not until 1912 was the identity of British

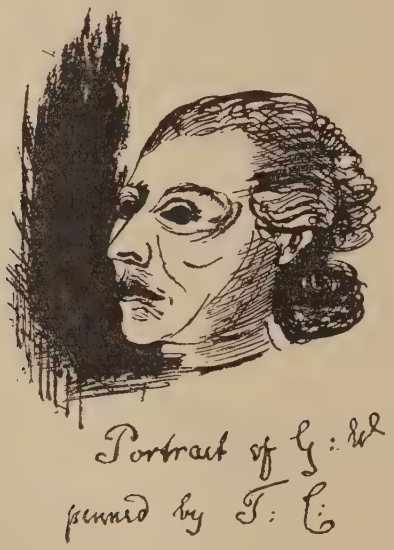
birds with those seen in South Africa during our winter placed beyond doubt by the finding of a ringed specimen. Six more have been recovered there since. And it has only recently been established that swallows on migration habitually fly low; and that they migrate visibly, and not at great heights or under cover of darkness. I have watched swallows on both spring and autumn passage travelling over Selborne parish in full view, taking flies as they went, but always keeping their direction. Gilbert White must often have seen them doing the same, without realizing its significance. They are so leisurely in their travels, and go in such small parties, spread out over weeks of time and hundreds of miles of front, that their movement is not at all conspicuous in spite of its magnitude.

From the pontifical elevation to which many generations of research have raised us it is easy to see that the theory which White was trying to confirm is wrong, and as easy to forget that the methods by which he worked were right and led to the truth being discovered. Such incredulity as he is often blamed for not having shown has nothing to do with science; it would equally have had to reject the fantastic but perfectly correct assertions which Jenner made about the breeding of the cuckoo in the same period. One cannot, until after the event, know what is incredible and false, and what is incredible but true.

If in the case of migration his views were inclined to be behind his time, in other directions they were far ahead of it. Few observers up to the present day have kept more systematic and valuable notes of the food of wild birds, or had a clearer idea of the economics of Nature. He is almost alone in invariably distinguishing song from sub-song; he notes, for example, on March 28, 1770, "Redwings congregate on trees and whistle inwardly. In their breeding-country they are good songsters," and in February "Linnets whistle inwardly as they sit in flocks." Occasionally there occur valuable notes on mammals, as on December 16, 1777: "One black rat was killed at Shalden some months ago, and esteemed a great curiosity. The Norway rats destroy all the indigenous ones." Within living memory

at that time the black rat had been the only British species, though it was not indigenous, having itself appeared only a few centuries earlier. As a source for the economic and social structure of eighteenth-century rural England White's journals and family letters are fully equal to Parson Woodforde's, and much more detailed. They compare well also in their vein of humour, which the standards of the time naturally excluded from *Selborne*. The voluminous *Naturalist's Journals* deserve to be printed in full; they are like poetry to read. I know nothing except *The Land* which so communicates the spirit of English country; they exhibit unrestrained the imaginative wealth which is partly stifled in the *Natural History* by conventional accretions. Such a January entry as "Larks rise and essay to sing" or in mid-December "Ice bears; boys slide," or on April 20 when the willow-wren "sings; a pretty plaintive note; some call it a joyous note; it begins with an high note and runs down"; or, at Fyfield, "Farmer Cannings plows with two teams of asses, one in the morning and one in the afternoon; at night these asses are folded on the fallows; and in winter they are kept in a straw-yard where they make dung," or, two days after Christmas "Here and there a lamb"—these are true particles of the magic which, even diluted, has given *Selborne* its power. In the *Journal* every kind of weather has some fresh epithet: Christmas, 1769, is a "sad wet day"; August 2, 1770, "Levant weather; a brisk gale all day that dies away at sunset"; July 23, "Sun. clouds; sultry: sweet eve"; January 29, 1774, "Small flights of snow"; May 13, "The horizon looks dark and louring"; June 16, "Tempestuous wind and vast rain for 22 hours"; August 2, "Autumnal chill in the air"; September 23, "sprinkling rain and rumbling wind"; October 10, 1769, "White frost: fine . . . most sweet day"; June 18, 1774, "Variable winds and clouds flying different ways"; February 23, 1779, "Drivers use the summer track; roads dusty"; April 4, 1771, "Pleasant day, but every thing quite dryed up. No lambs frolic and play as usual"; and from time to time "Ripening weather" or "Vast black and rock-like clouds." In

their context the vividness and variety of these brief un-self-conscious word-sketches are marvellous; after reading almost every extant phrase of Gilbert White's I go back to the later *Journals* as the quintessence.



II

MODERN SELBORNE AND SOME CHANGES IN ITS FAUNA

The observation of wild life has been kept up long enough in England to make it clear that changes in the relative strength of species are continually taking place, but not yet long enough to provide a satisfactory record for judging at all accurately what those changes are. Some appear obvious enough, but every alteration in the landscape demands a complex readjustment of fauna and flora, and though the primary consequences of building a new town or

felling a forest may usually be guessed, nothing except actual experience can determine the full effect of human operations upon Nature. In order to be of use to us, that experience must be recorded, and so made available for the observers of successive generations. In this respect the parish of Selborne has a considerable scientific importance, because there is no other place the fauna of which has been observed and described by careful field-naturalists for so long a series of years. The record on some points—the history of the black grouse in Wolmer for example—goes back as much as two centuries. It follows that there is nowhere else where the changes in our fauna from the eighteenth century onwards can be so fully traced.

To this body of observation the *Natural History of Selborne* forms the earliest, and therefore the most valuable, contribution, even disregarding the fact that without it the rest might never have been made. From a scientific point of view it has, however, considerable shortcomings. For example, a list of the birds which Gilbert White observed in Selborne parish, with some clue to their abundance in his day, would now be of the utmost value, but there is none to be found. He does in one place * mention that over a hundred and twenty species have been recorded in Selborne parish, and by dint of searching his MS. journals it is possible to ascertain what most of those species were, and to trace their fortunes between that time and this. But before doing so it is necessary to describe the changes in the parish itself, with which the fluctuations of the wild life are intimately connected.

Not many parishes outside the influence of towns have altered so much as Selborne has in the last hundred years. It was in Gilbert White's time a wide and almost barren tract. The village, cut off from the outer world by abominable lanes, only passable for carts and chaises specially constructed to the local gauge, was as nearly as possible self-contained. Wolmer Forest, which forms the larger

* Letter XL to Pennant, in a passage added when the book was taking final shape —the nominal date of Sept. 2nd, 1774, does not apply.

part of the parish,* was almost treeless, and comparatively undisturbed. It was as nearly pure waste as any land in England. It included some considerable sheets of water, and had from the standpoint of wild life the further advantage of being joined to a great mass of similar untamed country, stretching with hardly a break northwards by Frensham Pond to the Aldershot and Bagshot Heaths, eastwards to Godalming, Hindhead and Blackdown, and south to the commons about Rake and Rogate. It was as large as the New Forest, and at least as wild. That great wilderness, on which Wolmer must have depended for its stock of black grouse, is now broken up into insignificant patches of heath. The forest of young pines between Bagshot and Wokingham has smothered most of the northern part, while Aldershot, Farnborough, and Camberley, with their innumerable satellite camps, occupy the rest, keeping it in a state of perpetual disturbance. From Farnham, Haslemere and Godalming building has spread on all sides without restraint or forethought. Frensham Ponds are a crowded and littered picnic resort. Even if the parish of Selborne had escaped, these developments would have left it isolated, deprived of the wide reservoir from which some of its most notable wild creatures were drawn. But Selborne has by no means escaped. In 1811 Lord Stawell's lease expired—it was he who held the Forest at the time of the *Natural History*—and the Crown resumed possession of Wolmer. Forestry had now been taken up by many of the great landowners, and conifers especially had been successful on a large scale. But in the Napoleonic wars a shortage of timber had been severely felt, and since England still had to rely upon wooden walls it was thought necessary to plant more trees. Accordingly some plantations of Scots pine were made in Wolmer, " under the orders of the smooth Mr. Huskisson," as William Cobbett noted when he passed this way on his Rural Rides of 1822 and 1823. The afforestation policy has been continued ever since, so that there are

* Wherever " Selborne parish " is spoken of, the reference (unless the contrary is expressly stated) is to the ancient parish and the present civil parish, not the modern ecclesiastical parish as curtailed by the separation of Blackmoor and Oakhanger.

few considerable open parts remaining of the tract which White described as "without one standing tree in the whole extent." * The slopes of Weaver's Down, Longmoor, Oakhanger Common and Shortheath are now the largest areas comparatively free of either plantations or self-sown trees. The same wave of pines has spread all over the sandy districts of Surrey, North-west Sussex and the borders of Hampshire—and to appreciate the sweeping nature of this change one has only to remember that it is doubtful if at the time Gilbert White began to observe there was a single pine growing outside ornamental grounds anywhere in southern England. He would have known as native trees the juniper and the yew—all other conifers are modern introductions. The widespread planting of pines must undoubtedly have led to a great increase in Selborne parish of all kinds of titmice, treecreepers, chaffinches, woodpeckers, jays and golden-crested wrens. It has restricted the haunts of the woodlark, stonechat, wheatear, meadow-pipit, linnet and two which are now extinct as breeding species—the black grouse and the Dartford warbler. Much as the area of open heath-land has shrunk, the area of water has lost in proportion even more. Bin's Pond near Oakhanger, which White singled out as the most notable for its wild life, was drained early. Wolmer Pond is now diminished to a miserable pool, lost in the middle of its ancient bed, and sandwiched between the modern main road from Farnham to Portsmouth, the military light railway on its very banks, and the camp and rifle-range at Longmoor. It is no longer a lake, but a marsh liable to flooding after heavy rain. Except for one rushy

* This description was not literally true : according to the contemporary Report of the Commissioners of Woods and Forests there were in 1789 a few oaks, hollies, alders and willows and one Scots pine plantation of about two or three acres, dating from the time of the earliest letters to Pennant. Some of these trees were "now about one Foot in Diameter and very thriving." The very common assertion that the pine was only reintroduced into Southern England about 1776 appears to be based on a statement in the *Victoria County History of Hampshire,* which is clearly wrong, since these in Wolmer were undoubtedly planted by 1769, at least seven years before Ocknell Clump.

overgrown pool it may in a normal summer be crossed dryshod. Seen from above, either from the rising ground close at hand or the more distant viewpoint of Wheatham Hill, it shows hardly a gleam of water; the impression is of a broad flat field carpeted with long tussocks and surrounded by pine plantations. (White expressly states that the shore in his time was perfectly naked.) There is no longer accommodation for " vast flocks of ducks, teals and widgeons, of various denominations " to lie all day long, even if they could accustom themselves to the din of the railway and the main road and the camp and the rifle range. It was only the great size of Wolmer that made it secure; there is no such security now. It appears in fact as unattractive a sheet of water for wildfowl as almost any in England. On an October morning walking over the bed I put up 26 mallard, 7 snipe, 2 carrion crows and a fair number of larks and meadow-pipits. That may be taken as a fair average for the bird population, although in May I have seen mallard (and also coot) in much greater strength, beside breeding redshank, snipe and lapwings. In view of the utter sophistication of the surroundings, and the incessant disturbance by troops and traffic, the amount of bird life surviving here is surprising. Hogmer or Hogmoor Pond even more than Wolmer suffers from having a large military camp —in this case Bordon—planted right on its banks. Although mentioned by White it is mostly outside the parish boundary. Cranmer, now drained, lay almost a mile due north of Wolmer.

Only the two smaller ponds at Oakhanger, notable as being the first place in the south of England where teal were discovered breeding, have escaped serious interference. One of them is now fenced round, but only in order to make it a bird-sanctuary; through its fence I have watched in autumn the well-known but inexplicable horseplay of a small flock of teal, when from two to half a dozen birds suddenly spring into the air, fly a few yards as if they were stricken with cramp, flop about the water, dive simultaneously (though the teal is not a diving duck), come up again and vigorously splash water over themselves and one another, till after a minute or

two the commotion dies down and they float placidly on the surface, dozing or preening. At this same spot in April I had the closest view of a drake teal in full plumage that I have ever enjoyed. They are tame and unsuspicious on the sanctuary pond, though elsewhere wild and shy. Coots, moorhens and dabchicks also flourish here.

Like Wolmer Forest Gilbert White's "sheep-down" above the Hanger has lost its open character; except a single small clearing near Wood Pond it is entirely overgrown with thicket and woodland. There is a recent larch-plantation at the Wadden near the north-east corner of the hill; the Scrubbs at the other end of the Hanger, described in 1830 as "variegated with low brush-wood and scattered grass and cattle-runs and winding paths," are now as densely clothed with beeches as the rest. The stone-curlews are squeezed out; and I have not been able to detect either in spring or autumn the ring-ousels which used to make a halt there. For this transformation Gilbert White himself is partly responsible. He made persistent attempts to clothe the naked part of the Hanger. Thus he has an entry:

> "I sent a woman up the hill with a peck of beech-mast which she tells me she has scattered all round the down amidst the bushes and brakes, where there were no beeches before. I also ordered Thomas to sow beech-mast in the hedges all round Baker's Hill."

The revolution in farming which began during his lifetime led to great changes in the English landscape. Along the Alton road, according to Bowdler Sharpe, "Hedges have been grubbed up, copses have disappeared, and the formerly existing small pastures have been incorporated into the large fields. . . ." This is very different from the general tendency of the age, which was to subdivide the ancient open fields with hedges, reducing them to a more manageable size, and to enclose land which had formerly been common. The fields on the east side of the Selborne-Alton road are particularly large for the south of England. This road is itself

entirely modern; when White was expecting visitors he advised them not to leave the Winchester road until the Horse and Jockey near East Tisted, and to come round to him from the west. The old deep lane, now so grown up that at most seasons it is pretty nearly impassable even on foot, is apparently no longer a right of way, and the one-inch Ordnance Survey does not mark its course. Starting from Gracious Street it winds in a more or less northerly direction, goes under the modern road by a miserable culvert south of Norton Farm, and continues to a point near Hartley Mauduit church. From there to Alton the old route is traceable on the map. The new road, according to Bowdler Sharp, dates from about 1860. It is straight and monotonous, but considered as a means of transport is undoubtedly an improvement. Mudie, who penetrated to Selborne by the old way in the 'thirties, brought back the report that "all the way from Harteley, which is at least two miles, the traveller sees little, save a narrow stripe of the sky, and steep banks, almost perpendicular, so near to each other that one carriage cannot pass another except at particular points, and presenting a mass of tangled roots interspersed with shivered rocks." He certainly does not exaggerate; that carriages ever managed to use the old road is difficult to believe now in its decay, so deep and narrow is a great part of its course. Being unused and overgrown it forms a long strip of sanctuary for robins, wrens, blackbirds, throstles and a few other species, which nest in the sheltered banks. The road from Selborne to Petersfield has lately been widened, especially under Nore Hill; the lane to the Forest remains fairly narrow, but is no longer recognizable as the scene of Cobbett's description.* These, however, are minor developments compared with the new roads of Wolmer Forest, which

* In *Rural Rides* he wrote, "I got a boy at Selborne to show me along the lanes out into Wolmer Forest on my way to Headley. The lanes are very deep; the wet *malme* just about the colour of rye-meal mixed up with water, and just about as clammy, came, in many places, very nearly up to my horse's belly. There was this comfort, however, that I was sure there was a bottom, which is by no means the case when you are among clays or quick-sands." This was thirty years after White's death.

was crossed in White's time by nothing but loose sandy tracks. The highway from Farnham to Petersfield and Portsmouth, which pierces both Wolmer and the Holt, is less than a hundred years old. It dates presumably from the period of the militarization of the Aldershot district, and its course over long distances is mathematically straight. So far as actual traffic is concerned the disturbing influence of these new roads has probably been unimportant. That from Wolmer Pond to Liphook, for example, follows the course of an earlier track. It is the developments these ambitious roads involve which affect the wild life. They parcel up and tame the uninhabited areas, and they have made it possible to turn the forest into a permanent training ground for troops. Longmoor and Bordon, both of which are right on the parish boundary, have large permanent garrisons, and they form the nucleus about which temporary camps spring up like mushrooms every summer. What peace the forest might still retain is persistently shattered by the field exercises of the troops and the rattle of rifle-ranges and the droning of military aircraft overhead. These last range over the whole parish from the Hanger to Weaver's Down almost all day and almost every day. The country peace which Selborne enjoyed in Gilbert White's time, that enfolding tranquillity when if a cock crows, or a dog barks, or a cuckoo calls in the distance the sound comes intact to the ear, instead of arriving marred by a dozen incongruous noises subconsciously perceived, is utterly broken by the military din. We customarily judge whether a place has been spoilt by the eye; if we judged by the ear the deterioration of Selborne would be more striking. Not that any impression should be given of the parish clanging incessantly with an ear-splitting pandemonium, but simply that it needs comparatively few explosive and droning and vibrating and rattling mechanical sounds to destroy quiet, if only they are persistent enough, and the Selborne atmosphere unquestionably suffers from them. It is found more easily now at other villages under the chalk downs than among the scenes where it was first interpreted.

To the eye Selborne is not on the whole very seriously damaged

by time. The village, certainly, consists in the main of modern houses more often ugly than mediocre, and with gardens more full of cabbages and washing than of old English herbs, though its inhabitants hold staunchly to their opinion that however thoroughly the place is sophisticated it remains as picturesque as it ever was, and however many villas and shop-fronts oust the ancient thatched cottages Selborne still makes a better show than any village in England. But the Plestor, and Gracious Street and the blue-shuttered cottages covered with masses of ivy by the stream near Wellhead still raise it out of the ruck. Outside, except for a few erections by the Alton road and on the slope of Selborne Hill, nothing has suffered. The Lithe and Dorton Woods, the Hanger, and Common, Nore Hill, and all the agricultural side of the parish are probably as unspoilt as when the *Natural History* was written. Hop-growing remains the dominant local interest. Farther out, the modern church at Blackmoor is obtrusive but satisfactory ; its war memorial cloisters are notably good. Here the pines begin. The hamlet of Oakhanger and Shortheath is probably much nearer to its eighteenth-century appearance than Selborne village ; it is a scattered squatter's community, of an unusual type, founded on ample common rights rather than orthodox capitalist agriculture. Other building has to be recorded chiefly about Whitehill on the Farnham-Petersfield road, towards Blackmoor Golf Links (another modern development affecting the fauna by adding to the sophistication of the neighbourhood) and a little on the Longmoor side of the parish. Much of these last is by origin parasitic on the garrison.

Having briefly compared the present topography of the parish with conditions in Gilbert White's time it is possible to attempt the same with at least a part of the fauna, and since the material for the ornithology is by far the most complete it seems desirable to examine that branch in some detail rather than glance more superficially over the whole.

We have to begin with a small group of birds which have ceased to inhabit the parish, at any rate as breeding species. The most

conspicuous of these is the black grouse, which has a long and complicated local history. Perhaps because of its polygamous customs its position never seems secure, and it falls into a decline much more rapidly than most species if the haunts become isolated and lose touch with a reserve of fresh stock. It was undoubtedly indigenous in southern England, but the gradual encroachment of agriculture and the dwindling of the open forests must have told heavily upon it. As the haunts became more widely separated the black grouse ceased to flourish, and the improvement of fire-arms and general increase of shooting for sport have also to be borne in mind in accounting for the extinction of the old Wolmer stock, which happened early in the eighteenth century. According to Gilbert White's recollection it was rare by about 1730, when he was a boy; in a letter written not long before the publication of *Selborne* he states that the last pack he remembered was killed about thirty-five years before, which would be the middle of the century. A solitary survivor had been seen " within these ten years." This would probably be a wanderer from one of the Sussex or Surrey haunts still occupied, or possibly from the New Forest, where black grouse survived within forty miles of Selborne, up to the beginning of the twentieth century. After Wolmer was planted, Sir Charles Taylor, when he was ranger of the forest early in the nineteenth century, had a fresh stock brought from Cumberland and turned down near Liphook. These re-established the species, but not for long. Colonel Fielden, who investigated the subject in 1872, reported between forty and fifty blackcocks on the ground and not more than six or seven grey-hens. Such a disproportion even in a monogamous species would have been unpromising enough; with the polygamous black grouse it pointed unmistakably to extinction, which soon followed. This time, moreover, the same fate was quickly overtaking the species in all its south-country haunts. On Blackdown the last grey-hen was shot on November 15, 1890, and the last Hindhead bird dates from the same year. About this period there were said to be two pairs near Thursley, where a pair was reported as late as 1905. Except

for occasional stray wanderers there are no black grouse now in south-east England, and there are few parts of the country where the species is in a satisfactory state. The Dartford warbler was never known to White—it was not discovered in England till 1773, when his period of full activity was already near its end, and he had been dead thirteen years when the nest was first recorded by Montagu. But it was almost certainly a common inhabitant of Wolmer Forest at that time; the adjoining tract of commons from Churt to Godalming formed its headquarters in this country till as lately as 1917. Fielden at the end of April, 1872, found it abundant in Wolmer, and once put up seven or eight within a radius of fifty yards. He saw nests there. Bell in 1875 recorded it for Wolmer in his list, and not in the category of the very rare. At what period it ceased to breed is hard to determine. In autumn I have myself seen a pair in Selborne parish; I had scarcely ceased to watch them when a flank of the advancing Northland (or Southland) cavalry swept through their haunt in sham engagement.

The raven is also lost, and has no nearer refuge than the Isle of Wight and Dorset cliffs, where a few still survive. Even last century Bell saw it on Selborne common; it was abundant enough in White's time, and is the subject of many entries in the *Naturalist's Journal*: "Oct. 24th A flock of 46 Ravens over the Hanger"; "1768, Sep. 12 Ravens flock on the Hanger"; "1769, Feb. 26 Raven sits"; "1770, April 11th Kite Sits. Raven has young"; "1778 Oct. 13. . . . Near 40 ravens have been playing about over the Hanger all day"; "1781 Feb. 14. Ravens build in the Hanger" and so on. The kite also, now reduced to a miserable remnant in the mountains of Wales, appears to have been a regular breeding species and is casually referred to, as on April 17, 1768, "Forked-tailed Kite has 3 eggs." Once on the way back from Ringmer (Nov. 13, 1771) he saw 16 at a time on the Downs. The status of the buzzard, now rare in Hampshire and unknown as a breeding species elsewhere in the eastern half of England, was very similar ("July 24 . . . young buzzards follow their dams with a piping wailing noise").

The record of the stone-curlew, which White knew so well, practically ceases with his death. Bell never saw one in a generation spent at Selborne (1844–77), though it was occasionally heard over the village by him and others all through the nineteenth century, and there is good authority for believing that it continued to breed close by. The growing up of the sheep-down and the loss of the fallows must in any case have told upon it; though still breeding within a dozen miles of Selborne it is not so flourishing as it was in Gilbert White's day.

The apparent failure of the ring-ousel migration at this point has already been mentioned. Even on Nore Hill I have failed to find any, and at Hindhead Punchbowl, once a regular halting-place, records have ceased during the last twenty years. On the South Downs in autumn the migration may still be observed, but not on a large scale; the decline of the ring-ousel in some of its breeding haunts must be at least partly responsible for the smaller passage movement.

The breeding of a pair of honey-buzzards half-way along the Bostal up the Hanger in the summer of 1780 was probably an exceptional occurrence, although the male haunted the spot again in June, 1781, and a note in the *Naturalist's Journal* on September 12, 1787, indicates that a brood was probably safely reared that season. The species was always scarce and a little uncertain in its breeding with us; constant persecution by collectors and gamekeepers doomed it to extinction, and for the last fifty years attempts to breed have only been spasmodic. The bird or birds known to Gilbert White as the hen-harrier or ringtail hawk make a further local extinction, or perhaps two. The first of these names was applied to the blue males, the second to the brown females, of what were afterwards found to be two distinct species—the hen harrier (*Circus cyaneus*) and Montagu's harrier (*C. pygargus*). From the meagre references it is impossible to be satisfied which it was that White knew—quite probably he knew both without distinguishing between them. The passage usually entitled " Hen Harrier " in the Miscellaneous Obser-

vations on Birds with Markwick's comments is more likely to refer to the peregrine than to either. Both used to breed in the south, and even during this century both have appeared and attempted to nest within a very short distance of Selborne. There is some evidence that the marsh harrier also was a local breeding species at this period. The *Naturalist's Journal* for 1769 contains an entry under July 18 (when White was staying at the neighbouring village of Newton Valence): "Moor buzzard, *milvus aeruginosus*, has young. It builds in low shrubs on wild heaths. Five young" (the "five" is substituted for "four," crossed out). Again under March 18, 1773, he notes "Milvus aeruginosus?" and on September 19, 1774, "A moor-buzzard with a white head was shot some time ago on Greatham-moor." This seems fairly conclusive.

The quail was known to Gilbert White as a rare and apparently irregular local summer migrant; he thought the neighbourhood too much enclosed for its liking. The general reduction in numbers which the species has since suffered has dried up our supply from the Continent, and the quail at the present time is one of the least familiar of all our breeding birds.

We have, then, about a dozen species which played an important part in the Selborne avifauna two hundred years ago, and have since ceased to belong to it, except perhaps as casual wanderers.

The corn-bunting he never satisfactorily identified in the parish until December 26, 1771; another observed sitting about the bushes in the North Field on July 21, 1773, may have bred but was more likely an unmated pioneer. It was, as he explicitly states, a rare bird locally. According to Bell it was common in his time towards Alton; I have never met with it myself in Selborne parish, and it is an exceedingly uncommon bird in the adjoining part of Surrey. The yellow wagtail, which I have once noted, may also have fallen off, but there is a serious doubt whether White really knew it, or at any rate distinguished it. It is exclusively a summer migrant, and his notes of it consistently occur in mid-winter; in the *Naturalist's Journal* he terms it the "yellow water-wagtail," though the true

yellow is a pastoral bird, and notes it on Christmas Day, 1773, as haunting shallow parts of Selborne stream. It seems clear that most if not all his records refer to the grey wagtail, which still haunts the same place. The grey, of course, has strikingly yellow underparts, and there is nothing extraordinary about the confusion, particularly when (as Mr. C. B. Moffat pointed out to me) Gilbert White calls the pied wagtail the grey and white water-wagtail, and is assumed to be referring to two species where only one is intended.

Birds which have fallen off in numbers include almost all the original inhabitants of Wolmer, particularly of its ponds. The lapwing and common snipe, though still not scarce, have obviously suffered from drainage, plantations and disturbance. The coot, dabchick and mallard have also undergone some restriction of range, but continue to flourish in their remaining haunts. The teal, which enjoys a sanctuary at Oakhanger, still breeds as freely as ever—it is more fond of swampy ground and less rigidly attached to sheets of water than the others. The moorhen, which prefers ponds surrounded by good cover, may safely be assumed to have increased with the planting of Blackmoor and the forest. It is especially common on the Selborne side of the parish. Several winter wanderers have fallen off in numbers all over the south of England. These include the golden plover—the "green whistling plover" of the *Naturalist's Journal*, which appears about mid-November "in small companies on the uplands," and which has suffered since from too wholesale wildfowling. "Wild geese," which are fairly frequently noted ("1771 Mar. 8 Large flocks of wild geese go over the forest to the eastward"; "1772 Mar. 17 Wild geese appear in a vast flock flying to the southward"; "1776 Jan. 21 Flocks of wild-geese pass over," etc.), would not at the present time be seen nearly so often in the district, though regular enough in many parts of England. The "wild-swan" (probably whooper), jack-snipe, wigeon and snow-bunting fall in the same class. The hooded crow must have remained at much the same degree of rarity, for White had never met with it in the district till he saw one at Faringdon on October 5,

1773; on November 16 following two passed over the Wakes; the third for the period is noted on November 29, 1775: and his brother Benjamin had seen a fourth on the common—these appear to be all, though it was abundant on the western side of Hampshire and along the South Downs in winter.

There were several more winter birds not included in *Selborne*. The bittern occasionally occurred; about January 14, 1774, three were shot almost simultaneously in the parish, one in Shrub-wood, another on the Bramshot side and a third on the Greatham side. On December 9 of the same year there is a note about "Mergus serratus, the Dun-diver, a very rare bird in these parts, . . . shot in James Knight's ponds just as it was emerging from the water with a considerable tench in its mouth." This was entered as probably a female goosander; the red-breasted merganser seems more likely. A pair of the same species were shot just after Christmas, 1788. A great northern diver was shot on a large pond in the Holt by one of Lord Stawel's keepers and sent to the naturalist on January 14, 1790; one was also taken alive in Wolmer Forest, where it occurred again in Bell's time. Gulls put in fairly frequent appearances. "10 or 12 large gulls sailing high in the air over Combewood Pond" are considered by Kelsall and Munn to have been probably Herring gulls, the commonest Hampshire species. A greater black-backed gull was shot on April 11, 1777, but this was at Chawton, some way outside the parish. Black-headed gulls were seen on Wolmer Pond on March 13, 1771, and one in December; there are other entries, generally of a vague sort, but he says on November 14, 1775, "Gulls very seldom appear in this district; except some times on the forest ponds."

The pochard and the tufted duck, which White does not mention, are now the most abundant winter waterfowl in this part of England; the latter at any rate breeds regularly and in some strength not far outside the parish. The magpie, which used to "come to our very windows between three and four in the morning" in cherry-time, has certainly gone down through persecution, and is now only moder-

ately plentiful; but the carrion crow is probably little less numerous than formerly—too cunning to fall a victim itself, it profits by the constant slaughter of its natural competitors. In Wolmer Forest several pairs flourish at the present time. During military operations, which they regard with interested suspicion, I have watched a pair overhead making a cautious reconnaissance, sheering off in alarm from the danger zone at each fresh rattle of musketry. In the eighteenth century the woodlark was undoubtedly a common local bird, and though the sheep-down which was their haunt is hopelessly overgrown, and the species has everywhere suffered a set-back (from which it seems now to be recovering), its strength in the parish is even now well above the average. I have found it in several localities in the forest part of the parish—for example, about Bordon and Whitehill and near the far boundary along the Liphook road. It seems proof against all ordinary disturbance, and is even able to reconcile itself to the fact that most of the remaining open tracts are exercise grounds for troops. Once I put one up in a pine wood between the military light railway and the main road—an unusual place to see a woodlark, in spite of its name. Gilbert White, as well as Bewick and others of the older writers, mention a custom of singing by night which appears almost to have lapsed until the last few years; lately this nocturnal music has begun to be noticed again, both in this neighbourhood and elsewhere.

The linnet, meadow-pipit, stonechat, whinchat and wheatear have probably been among the species adversely affected by planting or military occupation of their haunts, but except the last two all remain plentiful. The stonechat particularly is commoner in Wolmer at the present time than anywhere on the great tract of commons to the east. It is impossible to discover the status of the whinchat in Gilbert White's time; he undoubtedly confused it with the female and immature plumages of the stonechat, to such an extent that it is doubtful if the real whinchat was known to him at all. He has five references to the whinchat in the Letters (against only three to the much commoner stonechat) and every single one of them occurs

in winter—a season when the whinchat is practically never authentically recorded.* An isolated record might be believed, but this repeated assumption that they were commonly to be seen at a time when they are never seen now throws much doubt on the identification. When we find that the original entry in the *Naturalist's Journal* reads "stonechats," where the paragraph based on it in Letter XVII to Barrington has "whinchats," a mistake seems definitely indicated. The same question arises over the wheatear, but there is no doubt that he knew it well and reliable records of wintering are in this case far more plentiful. His claim to have seen "a few stragglers in many counties at all seasons of the year" cannot be entirely rejected, though he certainly much exaggerated the frequency of actual wintering. Late birds are pretty freely noticed throughout October and even November; pioneers arrive at the beginning of March or sometimes in February; an observer so much inclined to take their wintering for granted would put these down as resident birds. It is significant that he writes in the *Naturalist's Journal* for April 20, 1777, when the ornithological material was almost all written, "Wheatears appear on the common. They are not seen there in the winter." Neither the whinchat nor the wheatear is by any means abundant in Selborne parish now, though I have observed both. The reed-bunting, grasshopper warbler and sedge-warbler, though still numerous enough, must have been better off before their haunts were curtailed; for instance, some of the grasshopper warbler stations White mentions about Selborne have long had to be given up. The redstart, a bird which he knew well—he wrote in 1766: "Redstarts are a very common bird both in the fields and gardens"—has lost much ground since, though I have found a nest and eggs within a mile and a half of the parish boundary and seen a cock in May on the military light railway near Whitehill. It fluctuates greatly in different seasons and in different localities. The wryneck, which I have seen near Oakhanger and on migration at Wolmer Pond, was probably commoner in the eighteenth century; it has certainly

* The only credible date is an October one, but even that would be fairly late.

declined in England generally. The common Selborne birds of prey were and are the kestrel, sparrowhawk, barn owl and tawny owl; all except the last are less common than they should be, and fanatical pheasant-worship in the neighbourhood is probably to blame. The peregrine remains an occasionally noted and probably not infrequent wanderer, still breeding on the Isle of Wight. The hobby, apparently unknown to the naturalist, is seen most years in the neighbourhood (on June 11, 1877, one was shot off three eggs in Wolmer; it was breeding in a Scots pine). The osprey has ceased to breed in any part of the kingdom, and the prospect of seeing one fishing in Frensham Great Pond is distinctly poorer than it was a hundred years ago. The deadly efficiency of modern game-keeping (especially severe in Hampshire) was in Gilbert White's time only beginning to be attained.

The picture up to this point has not been a bright one. Beginning with species which have utterly vanished we have gradually worked through those showing more or less clearly a recent decline, and only where an increasing species fell naturally into one of the groups considered has any compensating progress been recorded. Yet on the whole the gains have balanced the loss; undoubtedly there is now a larger bird population in Selborne parish than there can possibly have been when most of it was bare open waste.

The most conspicuous result of the planting of the forest is an immense increase of titmice and their associates. Of titmice alone Selborne has six resident species—the great, blue, coal, marsh, willow, and long-tailed. All of these are in considerable strength at the present time, and five were known to White, but until recently the distinction between the black-capped tits (marsh and willow) was not appreciated, both being treated as a single species—the marsh-tit. As in the case of almost all previous allusions, the identity of the "marsh-tits" in *Selborne* is therefore uncertain. Judging by their present status it is highly probable that White knew both, without suspecting that they were separate forms. The differences are very slight. The black head of the marsh-tit has a coaly gloss;

in the willow-tit the pate is dull and sooty. The willow-tit shows a more or less conspicuous pale patch on its closed wing, and the tips of its slightly forked tail are rounded instead of square—an unreliable character in the field. The language, especially the songs, form the best guide once they have been mastered, but the voice of individual birds varies and the difference is more easily detected than expressed. The voice of the willow-tit is usually strikingly nasal compared with the other, and it is fond of uttering an uninterrupted flight of notes; its song, which I have heard in this neighbourhood on Nore Hill and near the Priory, is fluent and almost melodious, with notes reminiscent of the goldfinch and canary, and one phrase even of the nightingale. The distribution of the two forms is patchy and haphazard, but neither is by any means scarce. The willow-tit, which I have identified in Wolmer Forest, at Hawkley, Milland, Frensham Pond, Thursley, Haslemere and in many other parishes in the neighbourhood, seems to be dominant at present, though more detailed and protracted study would be required before that could be stated with any certainty. Immediately round Selborne village I have notes of willow-tits for Nore Hill and the Priory and of marsh-tits often in Dorton woods and in the high wood on Selborne Down. The willow-tit is of the same species as the American chickadee, to which admirers of *Selborne* across the Atlantic may plausibly attribute the "two quaint notes" of the spring call, described to Pennant. The remaining titmice, the treecreeper (mentioned in the *Journals* but not in the book), the nuthatch (which bred in Gilbert White's time in the churchyard yew), goldcrest, jay, and pied and green woodpeckers form in fact a distinct group of woodland birds which must owe their present flourishing state to the spread of trees, particularly conifers, over Wolmer Forest, Blackmoor, Selborne Down and elsewhere (the goldcrest, now very common about Selborne, is described by White as "almost as rare as any bird we know"). Milder winters have contributed to this result—that winters are distinctly milder no one who follows the exhaustive weather entries through year after year of the *Journals* can very well doubt. Wrens,

robins, dunnocks, throstles and blackbirds have been benefited by the same circumstances, and also by the intensive persecution of their natural enemies; the local strength of all these must be very near saturation-point. Possibly related to these factors, and the nature of the country, is the surprising frequency of blackbirds' and throstles' nests on the ground about Selborne. In less than a hundred yards of the bank of Dorton woods, where there are few suitable bushes, I have found a throstle's and three blackbirds', each with a clutch of four, and another blackbird's empty, all resting on the ground, within a few minutes; another afternoon I found half a dozen on stumps in the banks of the sunken lane to Hartley Mauduit, and the same thing was noticed on all sides. The mistle-thrush seems also to have increased, as it has in most parts. Wintering redwings and fieldfares depend on weather conditions generally. On May Day, 1925, in a high wind at Hartley Mauduit with rain beginning to sputter down, I saw a large flock of fieldfares, wild and shy, feeding in company with starlings; the hedges a hundred yards away were lined with fledgeling mistle-thrushes, and such purely summer birds as the turtledove, grasshopper warbler, wood-wren, swift and house-martin were seen the same day. These fieldfares, between sixty and seventy altogether, must have been in the district some time, for I saw a similar flock near the Priory nine days earlier. It is unusual for such large numbers to remain so late in southern England during a mild year.

Nightingales are not so common about Selborne as in some neighbourhoods, but they flourish on the Down and in other places which cannot have been their haunts so long as the stone-curlews liked them. The more woodland warblers—blackcap, chiffchaff, willow-wren and wood-wren—appear to have increased by colonizing areas unsuited to them in the eighteenth century. Undoubtedly Selborne gave Gilbert White every opportunity to become the discoverer of the wood-wren and the first to sort out the three similar forms satisfactorily; all three may be heard singing at once in May above the Wakes. The lesser whitethroat he hardly knew; it

occurs in the *Natural History* only as the " rare, and I think new, little bird " of Letter LVII to Barrington. But he mentions it as " common in some parts of the kingdom," which perhaps indicates that its colonization of the Selborne area dates from since his time. Its song, in fact, is much too loud and challenging to have been overlooked by him. The garden warbler he never mentions, probably he missed it in person and attributed its song to the blackcap, for it is now a common Selborne bird.

The woodcock, a winter migrant in the eighteenth century, was recorded in 1840 as breeding in the Holt and Fielden knew of two broods in Wolmer in 1872; it now breeds regularly in some numbers. The stock-dove, White's " woodpigeon," was then a winter visitor which had greatly declined in numbers; now it would be better classed as a fairly numerous resident species. The ring-dove, our own woodpigeon, has gained considerably by the plantation policy. The rook, according to Newton, undoubtedly bred at Selborne in White's day; I cannot trace his authority, and from the way he expressed it the element of doubt was probably considerable. Although no one was better entitled to give an opinion on this subject I believe he relied simply on the number of references to the domestic affairs of rooks in the *Naturalist's Journal*, and since Gilbert White was for twenty-five years curate of Faringdon, where there was certainly a rookery, and a frequent visitor to Ringmer and Fyfield, where there were others within full view of the windows, this hardly seems conclusive evidence. Selborne, as a matter of fact, is on the edge of one of those curious patches of England where the rook is almost a rare bird; this one extends eastward nearly as far as Godalming and south to Midhurst.

The hawfinch (Grosbeak of the Letters) is a further set-off to the lost forms. White knew it only as an irregular winter visitor, and Bell, though he seems to have met with it fairly often, only records it as breeding at Newton Valence. Now they breed freely and I have seen half a dozen together even in May. Their particular stronghold is the Hanger, alongside the Punfle, at the bottom of

the Zig-zag, where the dense canopy of beeches usually protects them from view, even when the unmistakable call-note sounds directly overhead, but they also haunt the Lithe and the grounds of the Wakes. The red-legged partridge, which was introduced into Suffolk at the time the *Natural History* was being written,[1] has since colonized the parish, like the little owl whose introduction dates from a hundred years later. The great crested grebe, a bird apparently unknown to White, which has lately extended its breeding range over the south of England, nested at Wolmer between 1900, but had ceased to do so by 1905; it still breeds commonly on Frensham ponds. The Journal for 1784 notes "a long-billed curlew" shot near the Priory, adding, "we see them now and then in very long frosts." Perhaps some of the "stone-curlews" noted as heard in winter really belonged to this species, which now breeds regularly not far from Selborne, and possibly has done so within the parish, where I have seen a pair haunting the same spot consistently in April and early May. The redshank has similarly made its appearance as a local breeding species, with a station within the parish at Wolmer Pond during the last twenty years; in the same period it has colonized a great part of the interior of England, relinquishing its preference for actual coasts and marshes. The cirl-bunting, also unknown to Gilbert White, now breeds about the village, where it was first recorded in 1848; I see no reason to doubt that it is a recent colonist, and to suggest that he simply overlooked it is seriously to underrate his curiosity, for its song is persistent and demands to be traced to the singer. It has undoubtedly extended its English range since Montagu first noticed it. It was, however, undoubtedly abundant about Alton by 1837.

There remain a miscellaneous group which demand cursory treatment. The siskin, a small finch to which White has only one reference, and that dubious, is now a local winter visitor, sometimes in considerable numbers. I have seen some in the district up to

[1] The stock of red-legs turned down at Harting in Sussex by Sir Henry Featherstonehaugh in 1776 had died out by 1850.

the last week in April, but have no evidence that they breed. The brambling, though he calls it "rare in these parts," is noted on several occasions; for instance January 24, 1770, February 23, 1775, and January 16, 1776. It is more common now, and in two years I have seen it in the neighbourhood as late as May. The crossbill has also improved its local status since the conifer invasion; it was recorded as breeding in the Holt in 1840 and has often bred in the district since, though not in the parish to my knowledge. The woodchat, waxwing, hoopoe, dipper (shot on a pond by the village April 20, 1786), ringed plover ("a sea lark shot at Newton Pond," July 28, 1775), spotted crake (Bin's Pond November 4, 1774, and Wolmer Forest August 26, 1777) are vagrants which occurred during the eighteenth century; White's records of the green sandpiper (some of which may be erroneous) are remarkably frequent. The greenshank, spotted redshank, golden oriole, cormorant, common tern, grey phalarope, and a good many other vagrants were recorded for the parish during the nineteenth century, but have no place in its standing avifauna. The starling has undoubtedly shown a striking increase, as in England generally. He notes on November 23, 1780, "Multitudes of starlings appear at Newton and run feeding about in the grass fields. No number is known to breed in these parts. This is therefore an emigration from some other district." Martins, though always fluctuating, have almost certainly fallen off; in White's time there were forty nests round the eaves of the Priory farmhouse alone. The same applies to swallows, but sand-martins have probably gained from the human exploitation of the Forest, and swifts certainly are no worse off. He noted that there were generally eight pairs, rising sometimes to twelve, while as soon as the young came out others from the wider neighbourhood appeared to rally to the village; W. H. Hudson, in *Hampshire Days*, observed the same thing independently four generations later. The red-backed shrike appears to have increased, since it is now a conspicuous summer migrant locally, where White hardly knew it, though he found the nest at South Lambeth, where

it would hardly be met with now. The corncrake, a common local breeding species during the nineteenth century, has lately relapsed to its former status of a passage migrant chiefly noticed in autumn. The planting of Wolmer gave an opportunity for the foundation of a heronry, which has had a fitful existence during the last two generations; in 1868 there were two small colonies, and in 1872 Fielden put the breeding strength at eight or ten pairs; by 1898 the strength was doubled, and nearly fifty young herons were fledged the year before. They used to fish at Wolmer Pond in White's time; he notes several there, for instance, on October 6, 1781.

The reed-warbler, though almost certainly present in White's time, was not recognized until Bell's.

To sum up, we may divide the Selborne avifauna into the following categories:

Breeding Species of White's Time, now Extinct as such.

Black grouse (prob. *c.* 1730; re-introduced, again lost *c.* 1880)
Dartford warbler
Raven (early nineteenth century)
Honey-buzzard
Kite
Buzzard
Montagu's harrier or hen harrier, or both
Marsh harrier
Quail
Stone-curlew?

New Breeding Species since White's Time.

Hawfinch
Cirl bunting
Lesser whitethroat?
Little owl
Red-legged partridge
Redshank
Woodcock
Stock-dove
Heron

Conspicuous Increases.

All titmice
Goldcrest
Treecreeper
Nuthatch
Jay
Blackbird
Throstle
Mistle-thrush
Wren
Robin
Dunnock
Pochard
Tufted duck
Great crested grebe

CONSPICUOUS DECREASES.

Woodlark
Ring-ousel
Redstart
Grasshopper warbler
Wryneck
Martin
Lapwing

In a paragraph added later to Letter XL to Pennant Gilbert White mentions that more than a hundred and twenty species are known to have occurred within the parish, and this review of the Selborne avifauna may be concluded by a reconstruction of that list compiled by reference to the *Natural History* and the *Journals*:

Raven
Carrion crow
Hooded crow
Rook
Jackdaw
Magpie
Jay
Starling
Hawfinch
Greenfinch
Bullfinch
Chaffinch
Linnet
Goldfinch
Siskin?
Brambling
House sparrow
Crossbill
Reed bunting
Corn bunting
Yellowhammer
Snow bunting
Skylark
Woodlark
Titlark (Tree and Meadow pipits)
Grey wagtail
Pied wagtail
Yellow wagtail (prob. in error)
Great tit
Coal tit
Blue tit
Marsh (and willow) tit
Long-tailed tit
Goldcrest
Treecreeper
Nuthatch
Wren
Dipper
Hedge-sparrow or dunnock
Throstle or song-thrush
Mistle-thrush
Blackbird
Fieldfare
Redwing
Ring-ousel
Robin or redbreast
Nightingale
Stonechat
Whinchat (prob. in error)
Wheatear

Redstart
Whitethroat
Lesser Whitethroat or pettichaps
Blackcap
Grasshopper warbler
Wood-wren
Willow-wren
Chiffchaff
Sedge-warbler
Spotted flycatcher
Waxwing
Woodchat
Red-backed shrike
Swallow
Martin
Sand-martin
Green woodpecker
Wryneck
Nightjar
Swift
Hoopoe
Cuckoo
Kingfisher
Tawny owl
Barn owl
Long-eared owl
Hen harrier
Marsh harrier or moor-buzzard
Sparrowhawk
Kestrel
Peregrine
Honey-buzzard
Buzzard
Kite

Heron
Bittern
Mallard
Teal
Wigeon
Red-breasted (?) merganser?
Whooper (?) Swan
Mute swan
" Wild goose "
Moorhen
Coot
Dabchick
Great northern diver
Herring gull
Black-headed gull
Stone-curlew
Golden plover
Lapwing
Ringed plover
Common sandpiper
Green sandpiper
Woodcock
Snipe
Jack snipe
Curlew
Spotted crake
Corncrake
Stock-dove
Ring-dove
Turtle-dove
Black grouse
Quail
Pheasant
Partridge

This gives a total of 118; there is explicit authority in the *Natural History* or the *Journals* for all except the siskin and herring-gull, the identity of these being perhaps too uncertain to justify him in counting them in the number of species. Kelsall and Munn

in *The Birds of Hampshire* give a list of the same length but slightly different composition, including the great grey shrike and great black-backed gull from outside the parish boundary. They plausibly suggest that the two spotted woodpeckers must also have been included, and according to Bell Gilbert White also knew the reed-warbler: these would raise the total to 121.

GILBERT WHITE.
The Lytton-Knebworth Portrait.

THE NATURAL HISTORY OF SELBORNE

LETTER I

TO THOMAS PENNANT, ESQUIRE

THE parish of SELBORNE lies in the extreme eastern corner of the county of *Hampshire*, bordering on the county of *Sussex*, and not far from the county of *Surrey*; is about fifty miles south-west of *London*, in latitude 51, and near midway between the towns of *Alton* and *Petersfield*. Being very large and extensive [1] it abuts on twelve parishes, two of which are in *Sussex*, viz. *Trotton* and *Rogate*. If you begin from the south and proceed westward the adjacent parishes are *Emshot*, *Newton Valence*, *Faringdon*, *Harteley Mauduit*, *Great Ward le ham*, *Kingsley*, *Hedleigh*, *Bramshot*, *Trotton*, *Rogate*, *Lysse*, and *Greatham*. The soils of this district are almost as various and diversified as the views and aspects. The high part to the south-west consists of a vast hill of chalk, rising three hundred feet above the village; and is divided into a sheep down, the high wood, and a long hanging wood called *The Hanger*. The covert of this eminence is altogether beech, the most lovely of all forest trees, whether we consider it's smooth rind or bark, it's glossy foliage, or graceful pendulous boughs. The down, or sheep-walk, is a pleasing park-like spot, of about one mile by half that space, jutting out on the verge of the hill-country, where it begins to break down into the plains, and commanding a very engaging view, being an assemblage of hill, dale, wood-lands, heath, and water. The prospect is bounded to the south-east and east by the vast range of mountains called *The Sussex Downs*, by *Guild-down* near *Guildford*, and by the *Downs* round *Dorking* and *Ryegate* in *Surrey*, to the north-east, which altogether, with the country beyond *Alton* and *Farnham*, form a noble and extensive outline.

At the foot of this hill, one stage or step from the uplands, lies the village, which consists of one single straggling street, three quarters of a mile in length, in a sheltered vale, and running parallel with *The Hanger*. The houses are divided from the hill by a vein of stiff clay [2] (good wheat-land), yet stand on a rock of white stone,[3] little in appearance removed from chalk; but seems so far from being calcarious, that it endures extreme heat. Yet that the freestone still preserves somewhat that is analogous to chalk, is plain from the beeches which descend as low as those rocks extend, and no farther, and thrive as well on them, where the ground is steep, as on the chalks.

The cart-way of the village divides, in a remarkable manner, two very incongruous soils. To the south-west is a rank clay,[4] that requires the labour of years to render it mellow; while the gardens to the north-east, and small enclosures behind, consist of a warm, forward, crumbling mould, called *black malm*,[5] which seems highly saturated with vegetable and animal manure; and these may perhaps have been the original site of the town; while the woods and coverts might extend down to the opposite bank.

At each end of the village, which runs from south-east to north-west, arises a small rivulet: that at the north-west end frequently fails; but the other is a fine perennial spring, little influenced by drought or wet seasons, called *Well-head*.* This breaks out of some high grounds joining to *Nore Hill*, a noble chalk promontory, remarkable for sending forth two streams into two different seas. The one to the south becomes a branch of the *Arun*, running to *Arundel*, and so falling into the *British* channel: the other to the north, the *Selborne* stream, makes one branch of the *Wey*; and, meeting the *Black-down* stream at *Hedleigh*, and the *Alton* and *Farn-*

* This spring produced, *September* 14, 1781, after a severe hot summer, and a preceding dry spring and winter, nine gallons of water in a minute, which is five hundred and forty in an hour, and twelve thousand nine hundred and sixty, or two hundred and sixteen hogsheads, in twenty-four hours, or one natural day. At this time many of the wells failed, and all the ponds in the vales were dry.

ham stream at *Tilford-bridge*, swells into a considerable river, navigable at *Godalming*; from whence it passes to *Guildford*, and so into the *Thames* at *Weybridge*; and thus at the *Nore* into the *German* ocean.

Our wells, at an average, run to about sixty-three feet,[3] and when sunk to that depth seldom fail; but produce a fine limpid water, soft to the taste, and much commended by those who drink the pure element, but which does not lather well with soap.

To the north-west, north and east of the village, is a range of fair enclosures, consisting of what is called a *white malm*,[4] a sort of rotten or rubble stone, which, when turned up to the frost and rain, moulders to pieces, and becomes manure to itself.*

Still on to the north-east, and a step lower, is a kind of white land,[4] neither chalk nor clay, neither fit for pasture nor for the plough, yet kindly for hops, which root deep into the freestone, and have their poles and wood for charcoal growing just at hand. This white soil produces the brightest hops.

As the parish still inclines down towards *Wolmer-forest*, at the juncture of the clays and sand[4] the soil becomes a wet, sandy loam, remarkable for timber, and infamous for roads. The oaks of *Temple* and *Blackmoor* stand high in the estimation of purveyors, and have furnished much naval timber; while the trees on the freestone grow large, but are what workmen call *shakey*, and so brittle as often to fall to pieces in sawing. Beyond the sandy loam the soil becomes an hungry lean sand,[4] till it mingles with the forest; and will produce little without the assistance of lime and turnips.

[1] In 1867 Blackmoor became a separate ecclesiastical parish, including Oakhanger, so that the vicar of Selborne's cure no longer extends over Wolmer Forest. But the civil parish remains unaltered, with an area of 7,915 acres. The modern spellings of the neighbouring parishes are Empshott, Newton Valence, Faringdon, Hartley Mauditt, East Worldham, Kingsley, Headley, Bramshott, Trotton, Rogate, Liss and Greatham.

[2] The *vein of stiff clay*, and the *rank clay* in the next paragraph are soils from chalk marl; the *rock of white stone* is Upper Greensand, of which formation the

* This soil produces good wheat and clover.

black malm (now called chloritic marl) is the uppermost bed. Selborne Hanger forms part of the eastern escarpment of the great chalk mass which includes Salisbury Plain, stretching westward unbroken to Mere in Wiltshire, and south-west beyond Dorchester. Immediately beyond Wolmer Forest the greensand rises to 918 feet at Blackdown, and 895 feet at Hindhead ; Selborne is principally a valley parish between these opposing uplands.

[3] Which is the general depth of the porous Upper Greensand beds resting upon impervious strata.

[4] The *white malm* and *white land* both belong to the Upper Greensand formation ; *the juncture of the clays and sand* is that between what are now called the Gault and Lower Greensand ; the *hungry lean sand* of Wolmer Forest is Lower Greensand, mainly of the Folkestone Beds.

LETTER II

TO THE SAME

In the court of *Norton* farm house, a manor farm to the north-west of the village, on the white malms, stood within these twenty years a *broad-leaved elm*,[1] or *wych hazel, ulmus folio latissimo scabro* of *Ray*, which, though it had lost a considerable leading bough in the great storm in the year 1703, equal to a moderate tree, yet, when felled, contained eight loads of timber ; and, being too bulky for a carriage, was sawn off at seven feet above the butt, where it measured near eight feet in the diameter. This elm I mention to show to what a bulk *planted elms* may attain ; as this tree must certainly have been such from it's situation.

In the centre of the village, and near the church, is a square piece of ground surrounded by houses, and vulgarly called *The Plestor*. In the midst of this spot stood, in old times, a vast oak, with a short squat body, and huge horizontal arms extending almost to the extremity of the area. This venerable tree, surrounded with stone steps, and seats above them, was the delight of old and young, and a place of much resort in summer evenings ; where the former sat in grave debate, while the latter frolicked and danced before them. Long might it have stood, had not the amazing tempest in 1703

overturned it at once, to the infinite regret of the inhabitants, and the vicar,[2] who bestowed several pounds in setting it in it's place again: but all his care could not avail; the tree sprouted for a time, then withered and died. This oak I mention to show to what a bulk *planted oaks* also may arrive: and planted this tree must certainly have been, as will appear from what will be said farther concerning this area, when we enter on the antiquities[3] of *Selborne*.

On the *Blackmoor* estate there is a small wood called *Losel's*,[4] of a few acres, that was lately furnished with a set of oaks of a peculiar growth and great value; they were tall and taper like firs, but standing near together had very small heads, only a little brush without any large limbs. About twenty years ago the bridge at the *Toy*,[5] near *Hampton Court*, being much decayed, some trees were wanted for the repairs that were fifty feet long without bough, and would measure twelve inches diameter at the little end. Twenty such trees did a purveyor find in this little wood, with this advantage, that many of them answered the description at sixty feet. These trees were sold for twenty pounds apiece.

In the centre of this grove there stood an oak, which, though shapely and tall on the whole, bulged out into a large excrescence about the middle of the stem. On this a pair of ravens[6] had fixed their residence for such a series of years, that the oak was distinguished by the title of *The Raven-tree*. Many were the attempts of the neighbouring youths to get at this *eyry*: the difficulty whetted their inclinations, and each was ambitious of surmounting the arduous task. But, when they arrived at the swelling, it jutted out so in their way, and was so far beyond their grasp, that the most daring lads were awed, and acknowledged the undertaking to be too hazardous. So the ravens built on, nest upon nest, in perfect security, till the fatal day arrived in which the wood was to be levelled. It was in the month of *February*, when those birds usually sit. The saw was applied to the butt, the wedges were inserted into the opening, the woods echoed to the heavy blows of the beetle or mallet, the tree nodded to it's fall; but still the dam sat on. At last, when it gave

way, the bird was flung from her nest; and, though her parental affection deserved a better fate, was whipped down by the twigs, which brought her dead to the ground.

[1] A wych elm, *Ulmus montana*, Stokes.

[2] Gilbert White, A.M., uncle of the author.

[3] This refers to a supposition that the oak was planted by the Prior of Selborne on receiving the Plestor, or pley-stow (play-place), as a grant from Sir Adam Gurdon in 1271. In that case it lived 432 years; its successor, a sycamore, is now about two hundred.

[4] This coppice long ago gave place to pasture.

[5] The Toy and the New Toye were celebrated old inns on the Middlesex bank of the Thames.

[6] Partly because of persecution and partly because most of its remaining haunts were poorly wooded the raven almost ceased to build in trees with us during the nineteenth century, but lately the custom has begun to be revived.

LETTER III

TO THE SAME

The fossil-shells of this district, and sorts of stone, such as have fallen within my observation, must not be passed over in silence. And first I must mention, as a great curiosity, a specimen that was plowed up in the chalky fields, near the side of the *Down*, and given to me for the singularity of it's appearance, which, to an incurious eye, seems like a petrified fish of about four inches long, the cardo passing for an head and mouth. It is in reality a *bivalve* of the *Linnæan Genus* of *Mytilus*, and the species of *Crista Galli* [1]; called by *Lister*, *Rastellum*; by *Rumphius*, *Ostreum plicatum minus*; by *D'Argenville*, *Auris Porci*, s. *Crista Galli*; and by those who make collections *cock's comb*. Though I applied to several such in London, I never could meet with an entire specimen; nor could I ever find in books any engraving from a perfect one. In the superb *museum* [2] at *Leicester-house* permission was given me to examine for this article; and, though I was disappointed as to the fossil, I was highly

gratified with the sight of several of the shells themselves in high preservation. This bivalve is only known to inhabit the *Indian* ocean, where it fixes itself to a *zoophyte*, known by the name *Gorgonia*. The curious foldings of the suture the one into the other, the alternate flutings or grooves, and the curved form of my specimen being much easier expressed by the pencil than by words, I have caused it to be drawn and engraved.

Cornua Ammonis [3] are very common about this village. As we were cutting an inclining path [4] up *The Hanger*, the labourers found them frequently on that steep, just under the soil, in the chalk, and of a considerable size. In the lane above *Well-head*, in the way to *Emshot*, they abound in the bank in a darkish sort of marl; and are usually very small and soft: but in *Clay's Pond*, a little farther on, at the end of the pit, where the soil is dug out for manure,[5] I have occasionally observed them of large dimensions, perhaps fourteen or sixteen inches in diameter. But as these did not consist of firm stone, but were formed of a kind of *terra lapidosa*, or hardened clay, as soon as they were exposed to the rains and frost they mouldered away. These seemed as if they were a very recent production. In the chalk-pit, at the north-west end of *The Hanger*, large *nautili* [6] are sometimes observed.

In the very thickest strata of our freestone, and at considerable depths, well-diggers often find large *scallops* or *pectines*, having both shells deeply striated, and ridged and furrowed alternately. They are highly impregnated with, if not wholly composed of, the stone of the quarry.

[1] The identification was wrong; it was actually *Ostrea ricordeana* d'Orbigny.

[2] The Leverian Museum, collected by Sir Ashton Lever (1729–88), was in Leicester Square and filled 16 rooms; it was valued at £53,000, and the price of admission was 5*s*. 3*d*. for each person. In 1783 it was offered for sale to the Trustees of the British Museum; they turned it down, and at the time of his death the owner had just secured Parliamentary powers to dispose of it by lottery. This was done, eight thousand tickets being sold at a guinea each; the winner moved it across the Thames, and it was eventually sold by auction in 7879 lots during 1806.

[3] Ammonites.

[4] The Bostal, made in Sept. 1780, from the foot of the Zig-Zag to the corner of the Wadden, at the expense of Thomas Holt White.

[5] Before artificial manures came into use "marling" was a common method of fertilising the soil. It was spread over the land, usually during summer, pulverised, and left on the surface all winter to become disintegrated and worked in by the action of frost and water. Gangs of labourers, each under a "lord" or captain, went round from farm to farm digging the marl.

[6] Probably *nautilus elegans*.

LETTER IV

TO THE SAME

As in a former letter the *freestone* [1] of this place has been only mentioned incidentally, I shall here become more particular.

This stone is in great request for hearth-stones, and the beds of ovens: and in lining of lime-kilns it turns to good account; for the workmen use sandy loam instead of mortar; the sand of which fluxes,* and runs by the intense heat, and so cases over the whole face of the kiln with a strong vitrified coat like glass, that it is well preserved from injuries of weather, and endures thirty or forty years. When chiselled smooth, it makes elegant fronts for houses, equal in colour and grain to the *Bath* stone; and superior in one respect, that, when seasoned, it does not scale. Decent chimney-pieces are worked from it of much closer and finer grain than *Portland*; and rooms are floored with it; but it proves rather too soft for this purpose. It is a freestone, cutting in all directions; yet has something of a grain parallel with the horizon, and therefore should not be *surbedded*, but laid in the same position that it grows in the quarry.† On the ground abroad this fire-stone will not succeed for pavements,

* There may probably be also in the chalk itself that is burnt for lime a proportion of sand: for few chalks are so pure as to have none.

† To *surbed* stone is to set it edgewise, contrary to the posture it had in the quarry, says Dr. *Plot, Oxfordsh.*, p. 77. But *surbedding* does not succeed in our dry walls; neither do we use it so in ovens, though he says it is best for *Teynton* stone.

because, probably some degree of saltness prevailing within it, the rain tears the slabs to pieces.* Though this stone is too hard to be acted on by vinegar; yet both the white part, and even the *blue rag*,[2] ferments strongly in mineral acids. Though the white stone will not bear wet, yet in every quarry at intervals there are thin strata of *blue rag*, which resist rain and frost; and are excellent for pitching of stables, paths and courts, and for building of dry walls against banks; a valuable species of fencing, much in use in this village, and for mending of roads. This *rag* is rugged and stubborn, and will not hew to a smooth face; but is very durable: yet, as these strata are shallow and lie deep, large quantities cannot be procured but at considerable expense. Among the *blue rags* turn up some blocks tinged with a stain of *yellow* or *rust colour*, which seem to be nearly as lasting as the blue; and every now and then balls of a friable substance, like rust of iron, called *rust balls*.

In *Wolmer Forest* I see but one sort of stone,[3] called by the workmen *sand*, or *forest-stone*. This is generally of the colour of rusty iron, and might probably be worked as iron ore; is very hard and heavy, and of a firm, compact texture, and composed of a small roundish crystalline grit, cemented together by a brown, terrene, ferruginous matter; will not cut without difficulty, nor easily strike fire with steel. Being often found in broad flat pieces, it makes good pavement for paths about houses, never becoming slippery in frost or rain; is excellent for dry walls, and is sometimes used in buildings. In many parts of that waste it lies scattered on the surface of the ground; but is dug on *Weaver's Down*, a vast hill on the eastern verge of that forest, where the pits are shallow, and the stratum thin. This stone is imperishable.

From a notion of rendering their work the more elegant, and giving it a finish, masons chip this stone into small fragments about the size of the head of a large nail; and then stick the pieces into

* "Firestone is full of salts, and has no sulphur: must be close grained, and "have no interstices. Nothing supports fire like salts; saltstone perishes exposed "to wet and frost."—*Plot's Staff.*, p. 152.

the wet mortar along the joints of their freestone walls: this embellishment [4] carries an odd appearance, and has occasioned strangers sometimes to ask us pleasantly, "whether we fastened our walls together with tenpenny nails."

[1] Upper greensand.
[2] Calcareous beds of upper greensand.
[3] Lower greensand (Folkestone Beds).
[4] Called "garneting" in Surrey, where it is supposed to prevent frost from disintegrating the mortar. It is widespread in greensand districts.

LETTER V

TO THE SAME

Among the singularities of this place the two rocky hollow lanes, the one to *Alton*, and the other to the forest, deserve our attention. These roads, running through the malm lands, are, by the traffick of ages, and the fretting of water, worn down through the first stratum of our freestone, and partly through the second; so that they look more like water-courses than roads; and are bedded with naked *rag* for furlongs together. In many places they are reduced sixteen or eighteen feet beneath the level of the fields; and after floods, and in frosts, exhibit very grotesque and wild appearances, from the tangled roots that are twisted among the strata, and from the torrents rushing down their broken sides; and especially when those cascades are frozen into icicles, hanging in all the fanciful shapes of frost-work. These rugged gloomy scenes affright the ladies when they peep down into them from the paths above, and make timid horsemen shudder while they ride along them; but delight the naturalist with their various botany, and particularly with their curious *filices* [1] with which they abound.

The manor of *Selborne*, was it strictly looked after, with all it's kindly aspects, and all it's sloping coverts, would swarm with game; even now hares, partridges, and pheasants abound; and in old days

woodcocks were as plentiful. There are few quails, because they more affect open fields than enclosures; after harvest some few land-rails are seen.

The parish of *Selborne*, by taking in so much of the forest, is a vast district. Those who tread the bounds are employed part of three days in the business, and are of opinion that the outline, in all it's curves and indentings, does not comprise less than thirty miles.

The village stands in a sheltered spot, secured by *The Hanger* from the strong westerly winds. The air is soft, but rather moist from the effluvia of so many trees; yet perfectly healthy and free from agues.[2]

The quantity of rain that falls on it is very considerable,[3] as may be supposed in so woody and mountainous a district. As my experience in measuring the water is but of short date, I am not qualified to give the mean quantity.* I only know that

		Inch.	Hund.
From May 1, 1779, to the end of the year	there fell	28	37 !
From Jan. 1, 1780, to Jan. 1, 1781	„	27	32
From Jan. 1, 1781, to Jan. 1, 1782	„	30	71
From Jan. 1, 1782, to Jan. 1, 1783	„	50	26 !
From Jan. 1, 1783, to Jan. 1, 1784	„	33	71
From Jan. 1, 1784, to Jan. 1, 1785	„	33	80
From Jan. 1, 1785, to Jan. 1, 1786	„	31	55
From Jan. 1, 1786, to Jan. 1, 1787	„	39	57

The village of *Selborne*, and large hamlet of *Oakhanger*, with the single farms, and many scattered houses along the verge of the

* A very intelligent gentleman assures me (and he speaks from upwards of forty years' experience) that the mean rain of any place cannot be ascertained till a person has measured it for a very long period. "If I had only measured the rain," says he, "for the four first years, from 1740 to 1743, I should have said the mean rain "at *Lyndon* was 16 1-hf. inch. for the year; if from 1740 to 1750, 18 1-hf. inches. "The mean rain before 1763 was 20 1-qr.; from 1763 and since, 25 1-hf.; from "1770 to 1780, 26. If only 1773, 1774, and 1775 had been measured, *Lyndon* "mean rain would have been called 32 inches."

forest, contain upwards of six hundred and seventy inhabitants.*

* *A* STATE *of the* Parish *of* SELBORNE,[4] *taken* October 4, 1783.

The number of tenements or families, 136.

The number of inhabitants in the street is 313 } Total, 676 : near five inhabitants
In the rest of the parish . . . . . 363 } to each tenement.

In the time of the Rev. *Gilbert White*, vicar, who died in 1727–8, the number of inhabitants was computed at about 500.

Average of baptisms for 60 years.

From 1720 to 1729, both years inclus.	Males	6,9	12,9
	Females	6,0	
From 1730 to 1739, both years inclus.	Males	8,2	15,3
	Females	7,1	
From 1740 to 1749, incl.	Males	9,2	15,8
	Females	6,6	
From 1750 to 1759, incl.	Males	7,6	15,7
	Females	8,1	
From 1760 to 1769, incl.	Males	9,1	18,0
	Females	8,9	
From 1770 to 1779, incl.	Males	10,5	20,3
	Females	9,8	

Total of baptisms of Males, 515 } 980
„ „ Females, 465 }

Total of baptisms from 1720 to 1779, both inclusive . . . 60 years . . . 980.

Average of burials for 60 years.

From 1720 to 1729, both years inclus.	Males	4,8	9,9
	Females	5,1	
From 1730 to 1739, both years inclus.	Males	4,8	10,6
	Females	5,8	
From 1740 to 1749, incl.	Males	4,6	8,4
	Females	3,8	
From 1750 to 1759, incl.	Males	4,9	10,0
	Females	5,1	
From 1760 to 1769, incl.	Males	6,9	13,4
	Females	6,5	
From 1770 to 1779, incl.	Males	5,5	11,7
	Females	6,2	

Total of burials of Males, 315 } 640
„ „ Females, 325 }

We abound with poor; many of whom are sober and industrious, and live comfortably in good stone or brick cottages, which are

Total of burials from 1720 to 1779, both inclusive . . . 60 years . . . 640.
Baptisms exceed burials by more than one third.
Baptisms of Males exceed Females by one tenth, or one in ten.
Burials of Females exceed Males by one in thirty.
It appears that a child, born and bred in this parish, has an equal chance to live above forty years.
Twins thirteen times, many of whom dying young have lessened the chance for life.
Chances for life in men and women appear to be equal.

A TABLE *of the* Baptisms, Burials, *and* Marriages, *from* January 2, 1761, *to* December 25, 1780, *in the* Parish *of* SELBORNE.

	Baptisms.			Burials.			Mar.
	M.	F.	Tot.	M.	F.	Tot.	
1761.	8	10	18	2	4	6	3
1762.	7	8	15	10	14	24	6
1763.	8	10	18	3	4	7	5
1764.	11	9	20	10	8	18	6
1765.	12	6	18	9	7	16	6
1766.	9	13	22	10	6	16	4
1767.	14	5	19	6	5	11	2
1768.	7	6	13	2	5	7	6
1769.	9	14	23	6	5	11	2
1770.	10	13	23	4	7	11	3
1771.	10	6	16	3	4	7	4
1772.	11	10	21	6	10	16	3
1773.	8	5	13	7	5	12	3
1774.	6	13	19	2	8	10	1
1775.	20	7	27	13	8	21	6
1776.	11	10	21	4	6	10	6
1777.	8	13	21	7	3	10	4
1778.	7	13	20	3	4	7	5
1779.	14	8	22	5	6	11	5
1780.	8	9	17	11	4	15	3
	198	188	386	123	123	246	83

During this period of twenty years the births of males exceeded those of females . . . 10.
The burials of each sex were equal.
And the births exceeded the deaths . . . 140.

glazed, and have chambers above stairs: mud buildings we have none. Besides the employment from husbandry, the men work in hop gardens, of which we have many; and fell and bark timber. In the spring and summer the women weed the corn; and enjoy a second harvest in September by hop picking. Formerly, in the dead months they availed themselves greatly by spinning wool, for making of *barragons*, a genteel corded stuff, much in vogue at that time for summer wear; and chiefly manufactured at *Alton*, a neighbouring town, by some of the people called Quakers: but from circumstances this trade is at an end.* The inhabitants enjoy a good share of health and longevity; and the parish swarms with children.

[1] Ferns.

[2] Malaria, at this period endemic in various parts of Britain, as it still is so far north as Holland. Its extirpation was unintentional, and is attributed to widespread drainage.

[3] Bell found the average at Selborne for the period 1850–74 to be 32·074 inches; Maxwell for 1885–98 made it 32·040 inches. At the present day rainfall at the Wakes often amounts to considerably more than 40 inches in a year. The correspondent cited above was Thomas Barker of Lyndon Hall, Rutland, the author's brother-in-law.

[4] These tables, drawn up by the author's nephew, Thomas Holt White, are of extraordinary value, since reliable population statistics for the period prior to the first census of 1801 are rare, and a mere register of births, marriages, and deaths, however trustworthy, loses half its significance when the size of the community involved is not known. The general conclusion now reached by statisticians is that during the eighteenth century the population of England was increasing, and that it was increasing rather through a steady fall in the death-rate than a rise in the birth-rate. How far do the Selborne figures bear this out? In 1783 the population of the parish was 676, and in the previous sixty years there had been a surplus of about 360 births over deaths. This surplus had not been stationary, but cumulative; in 1720–9 it averaged 3 per annum; in 1730–9, 4·7; in 1740–9, 7·4; in 1750–9, 5·7; in 1760–9, 4·6; in 1770–9, 8·6. For the first thirty years it averaged 5·03 and for the second thirty years 6·3. The set-back of 1760–9 was due to a rise in death-rate, not a decline of fertility. Now, taking the population for 1780 as 666, which is probably very near the mark, we get for that year a birth-rate of about 25·5 per 1,000, a death-rate of 22·5, and a marriage-rate of only 9. For the preceding decade on this basis the

* Since the passage above was written, I am happy in being able to say that the spinning employment is a little revived, to the no small comfort of the industrious housewife.

birth-rate had been practically 30 per 1,000, the death-rate under 18, and the marriage-rate 12. Compared with present-day figures the birth- and death-rates are roughly half as high again and the marriage-rate only two-thirds of our own—so low in fact that without the corroborative evidence we should suspect some error. Now, if we simply subtracted the natural increase we should deduce a population for 1720 of about 316, but according to a calculation of the author's uncle, Gilbert White, who was vicar until 1727, it was at this time actually about 500. In the first case we have a birth-rate of nearly forty and a death-rate of nearly thirty ; in the second case the birth-rate for 1720–9 would be about 25·8 and the death-rate 19·8—a more likely figure. But if the population in the 'twenties was already about 500, and it had only reached 676 by 1783 after a surplus of 360 births, clearly there must have been an emigration from the parish in this short interval of nearly 200 persons. We know that London and other towns were only peopled at this period by a continuous flow from the country. According to such figures as we have about four-sevenths of the seven or eight hundred thousand Londoners of the period were born in other parts of England and Wales ; the London death-rate about 1750 was something like 50 per 1,000, and there were 3 burials to 2 baptisms (2 to 1 at the worst period) notwithstanding that practically three-quarters of the children died under 5 years of age. On the other hand, we may take the view that the computation of Gilbert White the elder was seriously exaggerated, or else that there was a serious set-back between the time it was made and the 'twenties, when we may more reasonably suppose a population of under 450. The estimate may have been made at any time after his presentation in 1681. The birth-rate would in that case become about 29 and the death-rate under 23.

To sum up : if the population in the 'twenties was just under 450, then the death-rate during the next sixty years fell by about 5 per thousand and was responsible for the increasing surplus, and further there was an emigration from the parish of about 130 persons. This fits in well with the accepted theory. But if the population in the 'twenties was 500, then the increasing surplus was mainly due to a rise of 4 per thousand in the birth-rate, and the death-rate only fell by 2 per thousand ; in this case there must have been an emigration of nearly 200. This figure seems large, but it must be borne in mind that by the ratio of country-born Londoners to the rest of the nation the *average quota* of a village the size of Selborne would be about fifty natives settled in London at any given moment. This average applies to the remotest parts, so it is not hard to believe that a parish within fifty miles of the metropolis was drained two or three times as heavily, while the closeness of Portsmouth would account for another contingent of appreciable size. However we take it, the table gives a striking glimpse of the tremendous export of men demanded of an English village during the eighteenth century.

As to other points, the excess of male over female births is of course normal, and is generally offset by a higher mortality ; here, however, the female burials are actually the greater, which suggests a larger emigration of males. The number of persons to each tenement is naturally a little below the modern average figure.

LETTER VI

TO THE SAME

SHOULD I omit to describe with some exactness the *forest* of *Wolmer*, of which three fifths perhaps lie in this parish, my account of *Selborne* would be very imperfect, as it is a district abounding with many curious productions, both animal and vegetable; and has often afforded me much entertainment both as a sportsman and as a naturalist.

The royal *forest* of *Wolmer* is a tract of land of about seven miles in length, by two and a half in breadth, running nearly from North to South, and is abutted on, to begin to the South, and so to proceed eastward, by the parishes of *Greatham*, *Lysse*, *Rogate*, and *Trotton*, in the county of *Sussex*; by *Bramshot*, *Hedleigh*, and *Kingsley*. This royalty consists entirely of sand covered with heath and fern; but is somewhat diversified with hills and dales, without having one standing tree in the whole extent.[1] In the bottoms, where the waters stagnate, are many bogs, which formerly abounded with subterraneous trees; though Dr. *Plot* [2] says positively,* that "there never were any fallen trees hidden in the mosses of the southern counties". But he was mistaken: for I myself have seen cottages on the verge of this wild district, whose timbers consisted of a black hard wood, looking like oak, which the owners assured me they procured from the bogs by probing the soil with spits, or some such instruments: but the peat is so much cut out, and the moors have been so well examined, that none has been found of late.† Besides the oak, I

* See his Hist. of *Staffordshire*.

† Old people have assured me, that on a winter's morning they have discovered these trees, in the bogs, by the hoar frost, which lay longer over the space where they were concealed, than on the surrounding morass. Nor does this seem to be a fanciful notion, but consistent with true philosophy. Dr. *Hales* saith, "That the "warmth of the earth, at some depth under ground, has an influence in promoting "a thaw, as well as the change of the weather from a freezing to a thawing state, "is manifest, from this observation, viz., Nov. 29, 1731, a little snow having fallen "in the night, it was, by eleven the next morning, mostly melted away on the surface

have also been shown pieces of fossil-wood of a paler colour, and softer nature, which the inhabitants called fir: but, upon a nice examination, and trial by fire, I could discover nothing resinous[4] in them; and therefore rather suppose that they were parts of a willow or alder, or some such aquatic tree.

This lonely domain is a very agreeable haunt for many sorts of wild fowls, which not only frequent it in the winter, but breed there in the summer; such as lapwings, snipes, wild-ducks, and, as I have discovered within these few years, teals.[5] Partridges in vast plenty are bred in good seasons on the verge of this forest, into which they love to make excursions: and in particular, in the dry summer of 1740 and 1741, and some years after, they swarmed to such a degree that parties of unreasonable sportsmen killed twenty and sometimes thirty brace in a day.

But there was a nobler species of game in this forest, now extinct, which I have heard old people say abounded much before shooting flying became so common, and that was the *heathcock, black game,* or *grouse.* When I was a little boy I recollect one coming now and then to my father's table. The last pack remembered was killed about thirty-five years ago; and within these ten years one solitary *grey hen* was sprung by some beagles in beating for a hare. The sportsmen cried out, "A hen pheasant"; but a gentleman present, who had often seen grouse in the north of England, assured me that it was a greyhen.

Nor does the loss of our black game prove the only gap in the *Fauna Selborniensis*; for another beautiful link in the chain of beings

"of the earth, except in several places in *Bushy-park*, where there were *drains* dug "and covered with earth, on which the snow continued to lie, whether those drains "were full of water or dry; as also where *elm-pipes* lay under ground: a plain "proof this, that those drains intercepted the warmth of the earth from ascending "from greater depths below them: for the snow lay where the drain had more than "four feet of earth over it. It continued also to lie on thatch, tiles, and the tops "of walls." See *Hales's* Hæmastatics: p. 360. Quere: might not such observations be reduced to domestic use, by promoting the discovery of old obliterated drains and wells about houses; and in Roman stations and camps lead to the finding of pavements, baths[3] and graves, and other hidden relics of curious antiquity?

is wanting, I mean the *red deer*, which toward the beginning of this century amounted to about five hundred head, and made a stately appearance. There is an old keeper, now alive, named *Adams*,[6] whose great grandfather (mentioned in a perambulation taken in 1635), grandfather, father and self, enjoyed the head keepership of *Wolmer forest* in succession for more than an hundred years. This person assures me, that his father has often told him, that Queen *Anne*, as she was journeying on the *Portsmouth* road, did not think the forest of *Wolmer* beneath her royal regard. For she came out of the great road at *Lippock*, which is just by, and, reposing herself on a bank smoothed for that purpose, lying about half a mile to the east of *Wolmer-pond*, and still called Queen's-bank, saw with great complacency and satisfaction the whole herd of red deer brought by the keepers along the vale before her, consisting then of about five hundred head. A sight this worthy the attention of the greatest sovereign! But he further adds that, by means of the *Waltham blacks*,[7] or, to use his own expression, as soon as they began *blacking*, they were reduced to about fifty head, and so continued decreasing till the time of the late Duke of *Cumberland*. It is now more than thirty years ago [8] that his highness sent down an huntsman, and six yeomen-prickers, in scarlet jackets laced with gold, attended by the stag-hounds; ordering them to take every deer in this forest alive, and convey them in carts to *Windsor*. In the course of the summer they caught every stag, some of which showed extraordinary diversion: but, in the following winter, when the hinds were also carried off, such fine chases were exhibited as served the country people for matter of talk and wonder for years afterwards. I saw myself one of the yeomen-prickers single out a stag from the herd, and must confess that it was the most curious feat of activity I ever beheld, superior to anything in Mr. *Astley's* riding-school. The exertions made by the horse and deer much exceeded all my expectations; though the former greatly excelled the latter in speed. When the devoted deer was separated from his companions, they gave him, by their watches, law, as they called it, for twenty minutes; when,

sounding their horns, the stop-dogs were permitted to pursue, and a most gallant scene ensued.

[1] The fern was simply bracken ; actually Wolmer was not treeless at this time, for according to the depositions of the Keepers in 1789 there were a few oaks, hollies, alders, and willows, besides a small plantation of Scots pine made between 1760 and 1770, and now well grown. *Sixth Report of the Commissioners appointed to enquire into the condition of Woods and Forests, Appendix*, 1790.

[2] Dr. Robert Plot, first curator of the Ashmolean at Oxford, and author of two pioneer natural histories of Oxfordshire and Staffordshire. The latter, here quoted, was published in 1686.

[3] When the above note was written remains of Roman villas in this country were commonly regarded as baths, owing to the presence of hypocausts.

[4] Henry White, a Keeper of Wolmer Forest, informed the Commissioners on oath in 1789 that " In the Mosses Roots and Stems of Trees are often dug up, some of which are Oak and others Fir, but none of great Size." Another witness had seen fir alone, some of considerable girth. The Commissioners seem to have had no doubts on this point, and appear to have been influenced by it in recommending Wolmer as suitable for conifer plantations.

[5] All these still breed, and in addition the redshank.

[6] According to his statement on oath before the Commissioners Adams was 76 years of age in 1789. He succeeded his father as Keeper of Linchborough Walk *c.* 1744, on the appointment of Ruperta Howe, but was removed *c.* 1750 by Mordaunt. He was afterwards for four years Keeper of Bordon Lodge under Bilson-Legge.

[7] A gang of local deer-stealers, whose exploits are described in the next letter.

[8] *C.* 1750. About 1744 the head of deer in Wolmer was still at fifty.

LETTER VII

TO THE SAME

THOUGH large herds of deer do much harm to the neighbourhood, yet the injury to the morals of the people is of more moment than the loss of their crops. The temptation is irresistible ; for most men are sportsmen by constitution : and there is such an inherent spirit for hunting in human nature, as scarce any inhibitions can

restrain. Hence, towards the beginning of this century all this country was wild about deer-stealing. Unless he was a *hunter*, as they affected to call themselves, no young person was allowed to be possessed of manhood or gallantry. The *Waltham blacks* at length committed such enormities, that government was forced to interfere with that severe and sanguinary act called the *black act*,* [1] which now comprehends more felonies than any law that ever was framed before. And, therefore, a late bishop of *Winchester*, when urged to re-stock *Waltham chase*,† refused, from a motive worthy of a prelate, replying that " it had done mischief enough already ".

Our old race of deer-stealers are hardly extinct yet: it was but a little while ago that, over their ale, they used to recount the exploits of their youth; such as watching the pregnant hind to her lair, and, when the calf was dropped, paring its feet with a penknife to the quick to prevent it's escape, till it was large and fat enough to be killed; the shooting at one of their neighbours with a bullet in a turnip-field by moonshine, mistaking him for a deer; and the losing a dog in the following extraordinary manner:—Some fellows, suspecting that a calf new-fallen was deposited in a certain spot of thick fern, went, with a lurcher, to surprise it; when the parent-hind rushed out of the brake, and, taking a vast spring with all her feet close together, pitched upon the neck of the dog, and broke it short in two.

Another temptation to idleness and sporting was a number of rabbits, which possessed all the hillocks and dry places; but these being inconvenient to the huntsmen, on account of their burrows, when they came to take away the deer, they permitted the country people to destroy them all.

Such forests and wastes, when their allurements to irregularities are removed, are of considerable service to neighbourhoods that verge upon them, by furnishing them with peat and turf for their firing; with fuel for the burning their lime; and with ashes for

* Statute 9 *Geo.* I. c. 22.

† This chase remains un-stocked to this day; the bishop was Dr. *Hoadly*.

their grasses; and by maintaining their geese and their stock of young cattle at little or no expense.

The manor-farm of the parish of *Greatham* has an admitted claim, I see, (by an old record taken from the *Tower of London*) of turning all live stock on the forest, at proper seasons, *bidentibus exceptis*.* The reason, I presume, why sheep † are excluded, is, because, being such close grazers, they would pick out all the finest grasses, and hinder the deer from thriving.

Though (by statute 4 and 5 *W.* and *Mary*, c. 23) "to burn on "any waste, between *Candlemas* and *Midsummer*, any grig,[2] ling, "heath and furze, goss [2] or fern, is punishable with whipping and "confinement in the house of correction"; yet, in this forest, about *March* or *April*, according to the dryness of the season, such vast heath-fires are lighted up, that they often get to a masterless head, and, catching the hedges, have sometimes been communicated to the underwoods, woods, and coppices, where great damage has ensued. The plea for these burnings is, that, when the old coat of heath, &c., is consumed, young will sprout up, and afford much tender brouze for cattle; but, where there is large old furze, the fire, following the roots, consumes the very ground; so that for hundreds of acres nothing is to be seen but smother and desolation, the whole circuit round looking like the cinders of a volcano; and, the soil being quite exhausted, no traces of vegetation are to be found for years. These conflagrations, as they take place usually with a north-east or east wind, much annoy this village with their smoke, and often alarm the country; and, once in particular, I remember that a gentleman, who lives beyond *Andover*, coming to my house, when he got on the downs between that town and *Winchester*, at twenty-five miles' distance, was surprised much with smoke and a hot smell of fire; and concluded that *Alresford* was in flames; but,

* For this privilege the owner of that estate used to pay to the king annually seven bushels of oats.

† In *The Holt*, where a full stock of fallow-deer has been kept up till lately, no sheep are admitted to this day.

when he came to that town, he then had apprehensions for the next village, and so on to the end of his journey.

On two of the most conspicuous eminences of his forest stand two *arbours* or *bowers*, made of the boughs of oaks; the one called *Waldon-lodge*,[3] the other *Brimstone-lodge*[3]: these the keepers renew annually on the feast of St. *Barnabas*, taking the old materials for a perquisite. The farm called *Blackmoor*,[4] in this parish, is obliged to find the posts and brush-wood for the former; while the farms at *Greatham*, in rotation, furnish for the latter; and are all enjoined to cut and deliver the materials at the spot. This custom I mention, because I look upon it to be of very remote antiquity.

[1] The Preamble describes it as "An Act for the more effectual punishing wicked and evil-disposed persons going armed in disguise, and doing injuries and violences to the persons and properties of his Majesty's subjects and for the more speedy bringing the offenders to justice.

"I. WHEREAS several ill-designing and disorderly persons have of late associated themselves under the name of *Blacks* and entered into confederacies to support and assist one another in stealing and destroying of deer, robbing of warrens and fish-ponds, cutting down plantations of trees, and other illegal practices, and have, in great numbers, armed with swords, fire-arms, and other offensive weapons, several of them with their faces blacked, or in disguised habits, unlawfully hunted in forests belonging to his Majesty, and in the parks of divers of his Majesty's subjects . . . and have likewise solicited several of his Majesty's subjects, with promises of money, or other rewards, to join with them, and have sent letters in fictitious names, to several persons, demanding venison and money, and threatening some great violence if such their unlawful demands should be refused, or if they should be interrupted in, or prosecuted for such their wicked practices, and have actually done great damage . . . to the great terror of his Majesty's peaceable subjects . . ." It was this statement of the case by which the severities of the Act were justified; in the first place the measure was only temporary, but it was later renewed.

[2] "grig" is a dialect form of "heather," and "goss" simply a variant of "gorse."

[3] Wall Down, now encroached on by building, is the eminence (379 feet above sea-level) about a quarter of a mile east of Whitehill on the Bordon-Petersfield road: Brimstone Lodge is at the highest point on the Liphook-Longmoor road, just east of Longmoor Camp. The feast of St. Barnabas (11th June) was reckoned the longest day by the old calendar.

[4] Blackmoor is now a considerable hamlet, which has grown up about the seat of the Earl of Selborne at Blackmoor House.

LETTER VIII

TO THE SAME

On the verge of the forest, as it is now circumscribed, are three considerable lakes, two in *Oakhanger*, of which I have nothing particular to say; and one called *Bin's*, or *Bean's pond*,[1] which is worthy the attention of a naturalist or a sportsman. For, being crowded at the upper end with willows, and with the *carex cespitosa*,*[2] it affords such a safe and pleasing shelter to wild ducks, teals, snipes, &c. that they breed there. In the winter this covert is also frequented by foxes, and sometimes by pheasants; and the bogs produce many curious plants (for which consult Letter XLII. to Mr. *Barrington*).

By a *perambulation* of *Wolmer forest* and *The Holt*, made in 1635, and in the eleventh year of *Charles* the First (which now lies before me), it appears that the limits of the former are much circumscribed. For, to say nothing of the farther side, with which I am not so well acquainted, the bounds on this side, in old times, came into *Binswood*; and extended to the ditch of *Ward le ham-park*, in which stands the curious mount called *King John's Hill*, and *Lodge Hill*; and to the verge of *Hartley Mauduit*, called *Mauduit-hatch*; comprehending also *Short-heath*, *Oakhanger*, and *Oakwoods*; a large district, now private property, though once belonging to the royal domain.

It is remarkable that the term *purlieu* is never once mentioned in this long roll of parchment. It contains, besides the *perambulation*, a rough estimate of the value of the timbers, which were considerable, growing at that time in the district of *The Holt*; and enumerates the officers, superior and inferior, of those joint forests, for the time being, and their ostensible fees and perquisites. In

* I mean that sort which, rising into tall hassocks, is called by the foresters *torrets*; a corruption, I suppose, of turrets.

Note. In the beginning of the summer 1787 the royal forests of *Wolmer* and *Holt* were measured by persons sent down by government.

those days, as at present, there were hardly any trees in *Wolmer forest*.

Within the present limits of the forest are three considerable lakes, *Hogmer*, *Cranmer*, and *Wolmer*; all of which are stocked with carp, tench, eels, and perch: but the fish do not thrive well, because the water is hungry, and the bottoms are a naked sand.

A circumstance respecting these ponds, though by no means peculiar to them, I cannot pass over in silence; and that is, that instinct by which in summer all the kine, whether oxen, cows, calves, or heifers, retire constantly to the water during the hotter hours; where, being more exempt from flies, and inhaling the coolness of that element, some belly deep, and some only to mid-leg, they ruminate and solace themselves from about ten in the morning till four in the afternoon, and then return to their feeding. During this great proportion of the day they drop much dung, in which insects nestle; and so supply food for the fish, which would be poorly subsisted but from this contingency. Thus Nature, who is a great economist, converts the recreation of one animal to the support of another! *Thomson*, who was a nice observer of natural occurrences, did not let this pleasing circumstance escape him. He says, in his *Summer*,

> "A various group the herds and flocks compose:
> "———————— on the grassy bank
> "Some ruminating lie; while others stand
> "Half in the flood, and, often bending, sip
> "The circling surface."

Wolmer-pond, so called, I suppose, for eminence sake, is a vast lake for this part of the world, containing, in it's whole circumference, 2,646 yards, or very nearly a mile and an half. The length of the north-west and opposite side is about 704 yards, and the breadth of the south-west end about 456 yards. This measurement, which I caused to be made with good exactness, gives an area of about

sixty-six acres,[3] exclusive of a large irregular arm at the north-east corner, which we did not take into the reckoning.

On the face of this expanse of waters, and perfectly secure from fowlers, lie all day long, in the winter season, vast flocks of ducks, teals, and widgeons, of various denominations; where they preen and solace, and rest themselves, till towards sun-set, when they issue forth in little parties (for in their natural state they are all birds of the night) to feed in the brooks and meadows; returning again with the dawn of the morning. Had this lake an arm or two more, and were it planted round with thick covert (for now it is perfectly naked), it might make a valuable decoy.[4]

Yet neither it's extent, nor the clearness of it's water, nor the resort of various and curious fowls, nor it's picturesque groups of cattle, can render this *meer* so remarkable as the great quantity of coins that were found in it's bed about forty years ago. But, as such discoveries more properly belong to the *antiquities* of this place, I shall suppress all particulars for the present, till I enter professedly on my series of letters respecting the more remote history[5] of this village and district.

[1] Bin's Pond, long drained, also lay on the Oakhanger side of the forest, close to where Bordon Railway Station is, and was connected with the Selborne stream. It was of small extent—not a quarter the size of Wolmer. The site is still swampy.

[2] *Carex paniculata*: actually used for church hassocks in old times, under the name of *pesses*.

[3] The total extent of the ponds in Wolmer Forest at this time was put at 86 acres only by the Commissioners in 1791.

[4] The first consideration in decoy-making was quiet; the selected pool must be remote from every source of disturbance and well protected by covert or dense beds of reeds. In form it was supposed to resemble a gigantic spider with extended legs—these were the tapering pipes, channels about 18 inches deep, covered with a net stretched on hoops, dwindling gradually from 17 to 18 feet wide at the entrance to a minute purse-net at the far end. By placing a pipe at each corner of the pond the decoy is workable from whatever quarter the wind may blow, for duck always prefer the lee shore. The actual decoy was a dog, trained to trot rapidly between a series of reed screens, and so arousing the curiosity of the ducks by the tantalising glimpses it afforded. When they had swum far enough down, the decoy man showed himself, cutting off the retreat.

[5] *The Antiquities of Selborne*, a work mainly compiled from ancient documents, which has been included in many editions from the first onwards, but not in this one, for reasons given in the *Preface*. The passage on these coins runs as follows : " Old people remember to have heard their fathers and grandfathers say that, in dry summers and in windy weather, pieces of money were sometimes found round the verge of Wolmer-pond ; and tradition had inspired the foresters with a notion that the bottom of that lake contained great stores of treasure. During the spring and summer of 1740 there was little rain : and the following summer also, 1741, was so uncommonly dry that many springs and ponds failed, and this lake in particular, whose bed became as dusty as the surrounding heaths and wastes. This favourable juncture induced some of the forest-cottagers to begin a search, which was attended with such success, that all the labourers in the neighbourhood flocked to the spot, and with spades and hoes turned up great part of that large area. Instead of pots of coins, as they expected, they found large heaps, the one lying on the other, as if shot out of a bag ; many of which were in good preservation. Silver and gold these enquirers expected to find ; but their discoveries consisted solely of many hundreds of Roman copper-coins, and some medallions, all of the lower empire. There was not much *virtu* stirring at that time in this neighbourhood ; however some of the gentry and clergy around bought what pleased them best ; and some dozens fell to the share of the author.

" The owners at first held their commodity at a high price, but, finding that they were not likely to meet with dealers at such a rate, they soon lowered their terms, and sold the fairest as they could. The coins that were rejected became current, and passed for farthings at the petty shops. Of those that we saw, the greater part were of Marcus Aurelius, and the Empress Faustina, his wife, the father and mother of Commodus. Some of Faustina were in high relief, and exhibited a very agreeable set of features, which probably resembled that lady, who was more remarkable for her beauty than for her virtues. The medallions in general were of a paler colour than the coins. To pretend to account for the means of their coming to this place would be spending time in conjecture. The spot, I think, could not be a Roman camp, because it is commanded by hills on two sides ; nor can I suppose that it was a Roman town, because I have too good an opinion of the taste and judgment of those polished conquerors to imagine that they would settle in so barren and dreary a waste."

In 1774 more coins were found at the pond, representing all the Emperors from Claudius to Commodus (A.D. 43–192). In 1873 an enormous hoard of coins contained in two urns was dug up a quarter of a mile north-west of the pond towards Blackmoor House. It included 29,786 catalogued coins—there were over 30,000 actually—all dating from the last sixty years of the third century A.D., and thought to have formed part of the war-chest of Allectus, usurping Emperor of Britain, who was overthrown and slain by Constantius Chlorus in 296–7. A good deal in the way of pottery, swords, and spears and axe-heads had been found in the neighbourhood a few years before.

LETTER IX

TO THE SAME

By way of supplement, I shall trouble you once more on this subject, to inform you that *Wolmer*, with her sister forest *Ayles Holt*, alias *Alice Holt*,* as it is called in old records,[1] is held by grant from the crown for a term of years.[2]

The grantees that the author remembers [2] are Brigadier-General *Emanuel Scroope Howe*, and his lady, *Ruperta*, who was a natural daughter of Prince *Rupert* by *Margaret Hughs*; a Mr. *Mordaunt*, of the *Peterborough* family, who married a dowager lady *Pembroke*; *Henry Bilson Legge* and lady; and now Lord *Stawel*, their son.

The lady of General *Howe* lived to an advanced age, long surviving her husband; and, at her death, left behind her many curious pieces of mechanism of her father's constructing, who was a distinguished mechanic† and artist,[3] as well as warrior; and, among the rest, a very complicated clock, lately in possession of Mr. *Elmer*, the celebrated game-painter at *Farnham*, in the county of *Surrey*.

Though these two forests are only parted by a narrow range of enclosures, yet no two soils can be more different: for *The Holt* consists of a strong loam, of a miry nature, carrying a good turf, and abounding with oaks that grow to be large timber; while *Wolmer* is nothing but a hungry, sandy, barren waste.[4]

The former, being all in the parish of *Binsted*, is about two miles in extent from north to south, and near as much from east to west; and contains within it many woodlands and lawns, and the *great lodge* where the grantees reside; and a smaller lodge, called *Goose-green*; and is abutted on by the parishes of *Kingsley*, *Frinsham*, *Farnham*, and *Bentley*; all of which have right of common.

* "In Rot. Inquisit. de statu forest. in Scaccar. 36. Ed. 3. it is called *Aisholt*." In the same, "Tit. *Woolmer* and *Aisholt* Hantisc. Dominus Rex habet unam capellam in *haia* suâ de Kingesle". "*Haia, sepes, sepimentum, parcus:* a Gall. *haie* and *haye*." Spelman's Glossary.

† This prince was the inventor of *mezzotinto*.

One thing is remarkable; that, though *The Holt* has been of old well stocked with fallow-deer, unrestrained by any pales or fences more than a common hedge, yet they were never seen within the limits of *Wolmer*; nor were the red deer of *Wolmer* ever known to haunt the thickets or glades of *The Holt*.

At present the deer of *The Holt* [5] are much thinned and reduced by the night-hunters, who perpetually harass them in spite of the efforts of numerous keepers, and the severe penalties that have been put in force against them as often as they have been detected, and rendered liable to the lash of the law. Neither fines nor imprisonments can deter them: so impossible is it to extinguish the spirit of sporting, which seems to be inherent in human nature.

General *Howe* turned out some *German* wild boars and sows in his forests, to the great terror of the neighbourhood; and, at one time, a wild bull or buffalo: but the country rose upon them and destroyed them.

A very large fall of timber, consisting of about one thousand oaks, has been cut this spring (viz. 1784) in *The Holt forest*; one fifth of which, it is said, belongs to the grantee, Lord *Stawel*. He lays claim also to the lop and top: but the poor of the parishes of *Binsted* and *Frinsham*, *Bentley* and *Kingsley*, assert that it belongs to them; and, assembling in a riotous manner, have actually taken it all away. One man, who keeps a team, has carried home, for his share, forty stacks of wood. Forty-five of these people his lordship has served with actions.[6] These trees, which were very sound, and in high perfection, were *winter-cut*, viz. in *February* and *March*, before the bark would run. In old times *The Holt* was estimated to be eighteen miles, computed measure, from water-carriage, *viz.* from the town of *Chertsey*, on the *Thames*; but now it is not half that distance, since the *Wey* is made navigable up to the town of *Godalming* in the county of *Surrey*.

[1] And on the modern Ordnance Survey.

[2] Wolmer was held by grant for periods of 45 years. Howe died a Lieutenant-General in 1709, eleven years before the author was born. He was a diplomat, and

fulfilled the trying duties of envoy extraordinary to the elector of Hanover (who under the Act of Settlement had become heir to the throne) from 1705 on. In this task he was handicapped by the indiscreet correspondence between Sarah Duchess of Marlborough and his wife Ruperta, who survived till 1740. The Hon. John Mordaunt, who was next granted a lease, assigned it to Henry Bilson-Legge (1708–64), Chancellor of the Exchequer in the Newcastle and Pitt Ministry of 1757–61, accounted the ablest financier of his time. Pitt once spoke of him as "the child, and deservedly the favourite child, of the Whigs"; his father, the 1st Earl of Dartmouth, had been lessee of Wolmer and the Holt before General Howe. His son, Lord Stawel (1757–1820), succeeded him as lessee and remained so all through the period of the *Natural History*; when his lease expired in 1811 the Commissioners of Woods and Forests resumed possession. The War Office has since acquired large rights, but the area, like all Crown lands of the same class, is now vested in the Forestry Commissioners.

[3] Ludwig von Siegen invented mezzotint, and imparted his secret to Prince Rupert, who introduced the art into England.

[4] Robert Briant, Deputy to the Surveyor-General of the Woods in Alice Holt and Wolmer in his deposition (C. of W. & F., p. 65) valued the soil of the Holt at 10–30 shillings an acre, and Wolmer at 4 shillings an acre.

[5] The head keeper about 1790 "says he has heard that when Mr. Legge first came to the Forest there were not more than Seven or Eight Deer in the Holt, but that he increased the Stock so much, that there were at one Time near Fifteen Hundred; that since he has been Keeper the Number has been as low as Three Hundred, but is now about Eight Hundred". (VIth *Report* C. of W. & F., p. 15.)

[6] Judgment went against them by default, the claim having already been threshed out and disallowed in 1741, when a purchaser of wood so obtained brought and won an action against the vendor. In 1788, just four years later, the Frensham people repeated the offence, carrying off openly 6,365 faggots, for the sale of which a day had already been fixed. They were aided and abetted by the keepers, and by the "Tything Man" of Frensham who stood out against executing the warrant for their apprehension. The claims of Lord Stawel himself appeared to the Commissioners scarcely less dubious, although more difficult to rebut.

LETTER X [1]

TO THE SAME

August 4, 1767.

It has been my misfortune never to have had any neighbours whose studies have led them towards the pursuit of natural knowledge: so that, for want of a companion to quicken my industry and sharpen

my attention, I have made but slender progress in a kind of information to which I have been attached from my childhood.

As to *swallows* (*hirundines rusticæ*) being found in a torpid state during the winter [2] in the isle of *Wight*, or any part of this country, I never heard any such account worth attending to. But a clergyman, of an inquisitive turn, assures me, that, when he was a great boy, some workmen, in pulling down the battlements of a church tower early in the spring, found two or three *swifts* (*hirundines apodes*) among the rubbish, which were, at first appearance, dead; but, on being carried toward the fire, revived. He told me that, out of his great care to preserve them, he put them in a paper-bag, and hung them by the kitchen fire, where they were suffocated.

Another intelligent person has informed me that, while he was a schoolboy at *Brighthelmstone*, in *Sussex*, a great fragment of the chalk-cliff fell down one stormy winter on the beach; and that many people found *swallows* among the rubbish: but, on my questioning him whether he saw any of those birds himself, to my no small disappointment, he answered me in the negative; but that others assured him they did.

Young broods of *swallows* began to appear this year on *July* the 11th, and young *martins* (*hirundines urbicæ*) were then fledged in their nests. Both species will breed again once. For I see by my *fauna* of last year, that young broods came forth so late as *September* the eighteenth. Are not these late hatchings more in favour of hiding than migration? Nay, some young martins remained in their nests last year so late as *September* the twenty-ninth; and yet they totally disappeared with us by the fifth of *October*.

How strange is it that the *swift*, which seems to live exactly the same life with the *swallow* and *house-martin*, should leave us before the middle of *August* invariably! while the latter stay often till the middle of *October*; and once I saw numbers of house-martins on the seventh of *November*. The martins and *red-wing fieldfares* [3] were flying in sight together; an uncommon assemblage of summer and winter-birds!

A little yellow bird [4] (it is either a species of the *alauda trivialis*, or rather perhaps of the *motacilla trochilus*) still continues to make a sibilous shivering noise in the tops of tall woods. The *stoparola* of *Ray* (for which we have as yet no name in these parts) is called, in your *Zoology*, the *fly-catcher*.[5] There is one circumstance characteristic of this bird, which seems to have escaped observation, and that is, that it takes it's stand on the top of some stake or post, from whence it springs forth on it's prey, catching a fly in the air, and hardly ever touching the ground, but returning still to the same stand for many times together.

I perceive there are more than one species of the *motacilla trochilus*: Mr. *Derham* supposes, in *Ray's Philos. Letters*, that he has discovered three. In these there is again an instance of some very common birds that have as yet no *English* name.

Mr. *Stillingfleet* makes a question whether the *black-cap* (*motacilla atricapilla*) be a bird of passage or not: I think there is no doubt of it: for, in *April*, in the first fine weather, they come trooping, all at once, into these parts, but are never seen in the winter. They are delicate songsters.

Numbers of *snipes* breed every summer in some moory ground on the verge of this parish. It is very amusing to see the cock bird on wing at that time, and to hear his piping and humming notes.

I have had no opportunity yet of procuring any of those mice which I mentioned to you in town. The person that brought me the last says they are plenty in harvest, at which time I will take care to get more; and will endeavour to put the matter out of doubt, whether it be a non-descript species or not.

I suspect much there may be two species of water-rats.[6] *Ray* says, and *Linnæus* after him, that the water-rat is web-footed behind. Now I have discovered a rat on the banks of our little stream that is not web-footed, and yet is an excellent swimmer and diver: it answers exactly to the *mus amphibius* of *Linnæus* (See *Syst. Nat.*), which he says "*natat in fossis & urinatur*". I should be glad to procure one "*plantis palmatis*". *Linnæus* seems to be in a puzzle

about his *mus amphibius*, and to doubt whether it differs from his *mus terrestris*; which if it be, as he allows, the "*mus agrestis capite grandi brachyuros*" of *Ray*, is widely different from the water-rat, both in size, make, and manner of life.

As to the *falco*, which I mentioned in town, I shall take the liberty to send it down to you into *Wales*; presuming on your candour, that you will excuse me if it should appear as familiar to you as it is strange to me. Though mutilated "*qualem dices . . . antehac fuisse, tales cum sint reliquiæ!*"

It haunted a marshy piece of ground in quest of wild-ducks and snipes: but, when it was shot, had just knocked down a rook, which it was tearing in pieces. I cannot make it answer to any of our *English* hawks; neither could I find any like it at the curious exhibition of stuffed birds in *Spring-Gardens*. I found it nailed up at the end of a barn, which is the countryman's museum.

The parish I live in is a very abrupt, uneven country, full of hills and woods, and therefore full of birds.

[1] It was actually with this letter that the Pennant correspondence opened on August 10th, 1767. It was addressed — Pennant, Esq., at Downing in Flintshire, North Wales, and began:

"Sir,—Nothing but the obliging notice you were so kind as to take of my trifling observations in the natural way, when I was in town in the spring, and your repeated mention of me in some late letters to my brother (Benjamin White, publisher of Pennant's *British Zoology*) could have emboldened me to have entered into a correspondence with you; in which though my vanity cannot suggest to me that I shall send you any information worthy your attention, yet the communication of my thoughts to a gentleman so distinguished for these kinds of studies will unavoidably be attended with satisfaction and improvement on my side. . . ."

[2] For a full discussion of this constantly recurring question see pages 42–46 of the Introduction.

[3] It has been suggested that this expression, repeated in Letter V to Barrington, is a misprint for *redwings and fieldfares*; it is not, for the MS. in both cases confirms the text. The modern *redwing* appears to be an abbreviated form; compare the tendency to write simply *woodchat* for *woodchat shrike*, *goldcrest* for *golden-crested wren*, *peregrine* for *peregrine falcon*, and so on. The appearance of pioneer winter visitors simultaneously with lingering swallows or martins, and *vice versa* in spring, is not uncommon.

[4] The wood-wren or wood-warbler. The *alauda trivialis* was the tree-pipit, not

yet distinguished in England from the meadow-pipit, and sharing with it the name of titlark. The *motacilla trochilus*, or willow-wren, is closely related to the wood-wren ; the tree-pipit belongs to a different family. The statement that the wood-wren was still singing in August is curious and open to doubt ; normally it ceases at the end of June, and unlike the chiffchaff and willow-wren does not resume in autumn.

[5] The spotted flycatcher.

[6] There is only one water-rat in England, and its feet are not webbed.

LETTER XI

TO THE SAME

Selborne, *September* 9, 1767.

It will not be without impatience that I shall wait for your thoughts with regard to the *falco* ; as to it's weight, breadth, &c. I wish I had set them down at the time : but, to the best of my remembrance, it weighed two pounds and eight ounces, and measured, from wing to wing, thirty-eight inches. It's *cere* and feet were yellow, and the circle of it's eyelids a bright yellow. As it had been killed some days, and the eyes were sunk, I could make no good observation on the colour of the pupils and the *irides*.

The most unusual birds I ever observed in these parts were a pair of *hoopoes* (*upupa*), which came several years ago in the summer, and frequented an ornamented piece of ground, which joins to my garden, for some weeks. They used to march about in a stately manner, feeding in the walks, many times in the day ; and seemed disposed to breed in my outlet ; but were frighted and persecuted by idle boys, who would never let them be at rest.

Three *gross-beaks* [1] (*loxia coccothraustes*) appeared some years ago in my fields, in the winter ; one of which I shot : since that, now and then one is occasionally seen in the same dead season.

A *cross-bill* (*loxia curvirostra*) was killed last year in this neighbourhood.

Our streams, which are small, and rise only at the end of the village, yield nothing but the *bull's head* or *miller's thumb* (*gobius*

fluviatilis capitatus), the *trout* (*trutta fluviatilis*), the eel (*anguilla*), the *lampern* (*lampætra parva et fluviatilis*, and the *stickle-back* (*pisciculus aculeatus*).[2]

We are twenty miles from the sea, and almost as many from a great river, and therefore see but little of sea-birds. As to wild fowls, we have a few teams of *ducks* bred in the moors [3] where the snipes breed; and multitudes of *widgeons* and *teals* in hard weather frequent our lakes in the forest.

Having some acquaintance with a tame *brown owl*, I find that it casts up the fur of mice, and the feathers of birds in pellets, after the manner of hawks: when full, like a dog, it hides what it cannot eat.

The young of the barn-owl are not easily raised, as they want a constant supply of fresh mice: whereas the young of the brown owl will eat indiscriminately all that is brought; snails, rats, kittens, puppies, magpies, and any kind of carrion or offal.

The house-martins have eggs still, and squab-young. The last swift I observed was about the twenty-first of *August*; it was a straggler.

Red-starts, *fly-catchers*, *white-throats*, and *reguli non cristati*, still appear [4]; but I have seen no *black-caps* lately.

I forgot to mention that I once saw, in *Christ Church* college quadrangle in *Oxford*, on a very sunny warm morning, a *house martin* flying about, and settling on the parapets, so late as the twentieth of *November*.

At present I know only two species of *bats*,[5] the common *vespertilio murinus* and the *vespertilio auritus*.

I was much entertained last summer with a tame bat, which would take flies out of a person's hand. If you gave it any thing to eat, it brought it's wing round before the mouth, hovering and hiding it's head in the manner of birds of prey when they feed. The adroitness it shewed in shearing off the wings of the flies, which were always rejected, was worthy of observation, and pleased me much. Insects seemed to be most acceptable, though it did not refuse raw flesh when offered: so that the notion that bats go down

chimnies and gnaw men's bacon, seems no improbable story. While I amused myself with this wonderful quadruped, I saw it several times confute the vulgar opinion, that bats when down on a flat surface cannot get on the wing again, by rising with great ease from the floor. It ran, I observed, with more dispatch than I was aware of; but in a most ridiculous and grotesque manner.

Bats drink on the wing, like swallows, by sipping the surface, as they play over pools and streams. They love to frequent waters, not only for the sake of drinking, but on account of insects, which are found over them in the greatest plenty. As I was going, some years ago, pretty late, in a boat from *Richmond* to *Sunbury*, on a warm summer's evening, I think I saw myriads of bats between the two places: the air swarmed with them all along the *Thames*, so that hundreds were in sight at a time.

I am, &c.

[1] This bird, now called the hawfinch, is at present a resident at Selborne, and not uncommon. It breeds in most parts of Britain, except north Scotland and Cornwall.

[2] The bullhead or miller's thumb, *Cottus gobio*, is a solitary fish generally three or four inches long, broad-headed, spiny, devoid of scales and variable in colour. It is found in clear streams in England and Wales, but not in Scotland or Ireland. The trout *Salmo trutta* is a well-known and abundant species, divided into many clearly marked forms. For a note on the eel, *Anguilla vulgaris*, see page 192. The lampern and brook lamprey are now grouped in one species, *Petromyzon fluviatilis*; the second, which does not go down to the sea, is considerably the smaller, never exceeding a foot in length. The three-spined stickleback, *Gasterosteus aculeatus*, is a common species, and the only one which was known to the writer, who in his original MS. called it a "minow".

[3] The tendency of modern usage is to restrict the word "moor" to its north-country sense of a barren heather upland; throughout the *Natural History of Selborne* it means a marsh, as it does in "moorhen" and many Wessex place-names—Sedgemoor, Otmoor, Staines Moor. Much of Wolmer in the eighteenth century would be a moor in either sense.

[4] In September. "Appear" is used by the author instead of "is seen"; the specialised sense by which "swallows appear" is limited to the earliest note of the season will be found entirely absent in this book.

[5] The true *Vespertilio murinus* (now *Myotis murinus*) is a non-British bat; the forms here intended are the common pipistrelle (*Pipistrellus pipistrellus*) and the long-eared, *Plecotus auritus*.

LETTER XII

TO THE SAME

November 4, 1767.

SIR,

IT gave me no small satisfaction to hear that the *falco* * turned out an uncommon one.[1] I must confess I should have been better pleased to have heard that I had sent you a bird that you had never seen before; but that, I find, would be a difficult task.

I have procured some of the mice [2] mentioned in my former letters, a young one and a female with young, both of which I have preserved in brandy. From the colour, shape, size, and manner of nesting, I make no doubt but that the species is non-descript. They are much smaller, and more slender, than the *mus domesticus medius* of *Ray*; and have more of the squirrel or dormouse colour: their belly is white; a straight line along their sides divides the shades of their back and belly. They never enter into houses; are carried into ricks and barns with the sheaves; abound in harvest; and build their nests amidst the straws of the corn above the ground, and sometimes in thistles. They breed as many as eight at a litter, in a little round nest composed of the blades of grass or wheat.

One of these nests I procured this autumn, most artificially platted, and composed of the blades of wheat; perfectly round, and about the size of a cricket-ball; with the aperture so ingeniously closed, that there was no discovering to what part it belonged. It was so compact and well filled, that it would roll across the table without being discomposed, though it contained eight little mice that were naked and blind. As this nest was perfectly full, how could the dam come at her litter respectively so as to administer a teat to each? perhaps she opens different places for that purpose, adjusting them again when the business is over: but she could not possibly be contained herself in the ball with her young, which moreover would be daily increasing in bulk. This wonderful pro-

* This hawk proved to be the *falco peregrinus*; a variety.

creant cradle, an elegant instance of the efforts of instinct, was found in a wheat-field suspended in the head of a thistle.

A gentleman, curious in birds, wrote me word that his servant had shot one last *January*, in that severe weather, which he believed would puzzle me. I called to see it this summer, not knowing what to expect: but, the moment I took it in hand, I pronounced it the male *garrulus bohemicus* or *German* silk-tail,[3] from the five peculiar crimson tags or points which it carries at the ends of five of the short remiges. It cannot, I suppose, with any propriety, be called an *English* bird: and yet I see, by *Ray's Philosoph. Letters*, that great flocks of them, feeding on haws, appeared in this kingdom in the winter of 1685.

The mention of haws puts me in mind that there is a total failure of that wild fruit, so conducive to the support of many of the winged nation. For the same severe weather, late in the spring, which cut off all the produce of the more tender and curious trees, destroyed also that of the more hardy and common.

Some birds, haunting with the missel-thrushes, and feeding on the berries of the yew-tree, which answered to the description of the *merula torquata* or *ring-ouzel*, were lately seen in this neighbourhood. I employed some people to procure me a specimen, but without success. See Letter VIII.

Query—Might not *Canary* birds[4] be naturalized to this climate, provided their eggs were put, in the spring, into the nests of some of their congeners, as goldfinches, greenfinches, &c.? Before winter perhaps they might be hardened, and able to shift for themselves.

About ten years ago I used to spend some weeks yearly at *Sunbury*,[5] which is one of those pleasant villages lying on the *Thames*, near *Hampton-court*. In the autumn, I could not help being much amused with those myriads of the swallow kind which assemble in those parts. But what struck me most was, that, from the time they began to congregate, forsaking the chimnies and houses, they roosted every night in the osier-beds of the aits of that river. Now this resorting towards that element, at that season of the year, seems

to give some countenance to the northern opinion (strange as it is) of their retiring under water. A *Swedish* naturalist [6] is so much persuaded of that fact, that he talks, in his calendar of *Flora*, as familiarly of the swallow's going under water in the beginning of *September*, as he would of his poultry going to roost a little before sunset.

An observing gentleman in *London* writes me word that he saw an house-martin, on the twenty-third of last *October*, flying in and out of it's nest in the *Borough*. And I myself, on the twenty-ninth of last *October* (as I was travelling through *Oxford*), saw four or five swallows hovering round and settling on the roof of the county-hospital.

Now is it likely that these poor little birds [7] (which perhaps had not been hatched but a few weeks) should, at that late season of the year, and from so midland a county, attempt a voyage to *Goree* or *Senegal*, almost as far as the *equator*? *

I acquiesce entirely in your opinion—that, though most of the swallow kind may migrate, yet that some do stay behind and hide with us during the winter.

As to the short-winged soft-billed birds, which come trooping in such numbers in the spring, I am at a loss even what to suspect about them. I watched them narrowly this year, and saw them abound till about *Michaelmas*, when they appeared no longer. Subsist they cannot openly among us, and yet elude the eyes of the inquisitive: and, as to their hiding, no man pretends to have found any of them in a torpid state in the winter. But with regard to their migration, what difficulties attend that supposition! that such feeble bad fliers (who the summer long never flit but from hedge to hedge) should be able to traverse vast seas and continents in order to enjoy milder seasons amidst the regions of *Africa*!

[1] It was a peregrine falcon, abnormal in having the ground-colour of the black-barred underparts dirty yellow instead of buffish white.

[2] Harvest-mice.

* See *Adanson's* Voyage to *Senegal*.

[3] The waxwing, a spasmodic winter visitor. The reference which follows is to a letter from Johnson to Ray in 1686, describing how " They came near us in great flocks like fieldfares and fed upon haws as they do ". During the last century there have been invasions in 1830–1, 1834–5, 1849–50, 1866–7, 1872–3, 1892–3, 1903–4, 1913–4, and 1921–2. A failure of wild berries in Scandinavia is supposed to be the cause.

[4] The serin, which is the same species as the wild canary (*Serinus canarius* L.), has recently extended its range northwards and now breeds in Holland, Germany, Belgium, and France, where it is rapidly increasing. The canary has proved capable, in open aviaries, of thriving during long spells with the temperature below zero.

[5] With a close friend, the Rev. John Mulso, Vicar of Sunbury 1746–60, who had since been preferred to the rectory of Witney ; it was on his return from a visit there that the author passed through Oxford and saw the swallows mentioned in the next paragraph.

[6] A. M. Berger, a pupil of Linnæus ; in 1761 a translation of his *Calendarium Florae,* written five years earlier, was published by Stillingfleet.

[7] Swallows ringed as nestlings in England and Scotland between June and August have lately been found in South Africa, from 26 to 33 degrees beyond the Equator, during the following January, February and March, their ages ranging from four to eight months.

LETTER XIII

TO THE SAME

Selborne, *Jan.* 22, 1768.

Sir,

As in one of your former letters you expressed the more satisfaction from my correspondence on account of my living in the most southerly county ; so now I may return the compliment, and expect to have my curiosity gratified by your living much more to the North.

For many years past I have observed that towards *Christmas* vast flocks of chaffinches have appeared in the fields ; many more, I used to think, than could be hatched in any one neighbourhood. But, when I came to observe them more narrowly, I was amazed to find that they seemed to me to be almost all hens. I communicated my suspicions to some intelligent neighbours, who, after taking

pains about the matter, declared that they also thought them all mostly females; at least fifty to one.[1] This extraordinary occurrence brought to my mind the remark of *Linnæus*; that "before winter all their hen chaffinches migrate through *Holland* into *Italy*". Now I want to know, from some curious person in the north, whether there are any large flocks of these finches with them in the winter, and of which sex they mostly consist? For, from such intelligence, one might be able to judge whether our female flocks migrate from the other end of the island, or whether they come over to us from the continent.

We have, in the winter, vast flocks of the common linnets; more, I think, than can be bred in any one district. These, I observe, when the spring advances, assemble on some tree in the sunshine, and join all in a gentle sort of chirping, as if they were about to break up their winter quarters and betake themselves to their proper summer homes. It is well known, at least, that the swallows and the fieldfares do congregate with a gentle twittering before they make their respective departure.

You may depend on it that the bunting, *emberiza miliaria*, does not leave this country in the winter. In *January* 1767, I saw several dozen of them, in the midst of a severe frost, among the bushes on the downs near *Andover*: in our woodland enclosed district it is a rare bird.

Wagtails, both white and yellow,[2] are with us all the winter. Quails crowd to our southern coast, and are often killed in numbers by people that go on purpose.

Mr. *Stillingfleet*, in his Tracts, says that "if the wheatear (*œnanthe*) "does not quit *England*, it certainly shifts places; for about harvest "they are not to be found, where there was before great plenty of "them". This well accounts for the vast quantities that are caught about that time on the south downs near *Lewes*, where they are esteemed a delicacy. There have been shepherds, I have been credibly informed, that have made many pounds in a season by catching them in traps. And though such multitudes are taken, I never

saw (and I am well acquainted with those parts) above two or three at a time: for they are never gregarious. They may perhaps migrate in general; and, for that purpose, draw towards the coast of *Sussex* in autumn: but that they do not all withdraw I am sure; because I see a few stragglers in many counties, at all times of the year,[3] especially about warrens and stone quarries.

I have no acquaintance, at present, among the gentlemen of the navy: but have written to a friend, who was a sea-chaplain in the late war,[4] desiring him to look into his minutes, with respect to birds that settled on their rigging during their voyage up or down the channel. What *Hasselquist* [5] says on that subject is remarkable: there were little short-winged birds frequently coming on board his ship all the way from our channel quite up to the *Levant*, especially before squally weather.

What you suggest, with regard to *Spain*, is highly probable. The winters of *Andalusia* are so mild, that, in all likelihood, the soft-billed birds that leave us at that season may find insects sufficient to support them there.[6]

Some young man, possessed of fortune, health, and leisure, should make an autumnal voyage into that kingdom; and should spend a year there, investigating the natural history of that vast country. Mr. *Willughby* * passed through that kingdom on such an errand; but he seems to have skirted along in a superficial manner and an ill humour, being much disgusted at the rude dissolute manners of the people.

I have no friend left now at *Sunbury* to apply to about the swallows roosting on the aits of the *Thames*: nor can I hear any more about those birds which I suspected were *merulæ torquatæ*.

As to the small mice, I have farther to remark, that though they hang their nests for breeding up amidst the straws of the standing corn, above the ground; yet I find that, in the winter, they burrow deep in the earth, and make warm beds of grass: but their grand rendezvous seems to be in corn-ricks, into which they are carried

* See *Ray's* Travels, p. 466.

at harvest. A neighbour housed an oat-rick lately, under the thatch of which were assembled near an hundred, most of which were taken; and some I saw. I measured them; and found that, from nose to tail, they were just two inches and a quarter, and their tails just two inches long. Two of them, in a scale, weighed down just one copper halfpenny, which is about the third of an ounce avoirdupois: so that I suppose they are the smallest quadrupeds in this island. A full-grown *mus medius domesticus* weighs, I find, one ounce lumping weight, which is more than six times as much as the mouse above; and measures from nose to rump four inches and a quarter, and the same in it's tail. We have had a very severe frost and deep snow this month. My thermometer was one day fourteen degrees and an half below the freezing-point, within doors. The tender evergreens were injured pretty much. It was very providential that the air was still, and the ground well covered with snow, else vegetation in general must have suffered prodigiously. There is reason to believe that some days were more severe than any since the year 1739–40.

I am, &c., &c.

[1] The reason for this curious custom has only very lately been discovered. Many small passerines, and especially the robin and chaffinch, find it necessary to safeguard their insect food supplies for the breeding season by a strict and fiercely exclusive territorial system, each cock laying claim to a definite suitable area, and attempting to hold it against all comers of his kind. Amongst pure migrants the result of this system is a race to the breeding quarters every spring, in which the females are far outstripped, and the males earliest on the scene have the pick of the territories. With species only partially migratory, like the robin and chaffinch, males remaining stationary on their territories at all seasons have an inestimable advantage over those spending the winter elsewhere, and returning in spring to find the best ground already occupied. It must be borne in mind that a bird in possession is, for psychological reasons, extremely difficult to evict, and that the numbers of these two species are so great that late-comers may have serious difficulty in finding suitable stations. The females, who are less directly interested in territory, are under no such obligation to stay at home; consequently they tend to migrate much more readily than the adult males, which seem generally to remain till they are actually dislodged by hard weather. But over a great part of Europe the chaffinch appears to be growing more sedentary, and this division of the sexes is rarely striking now. Among robins, owing to the

sexes being alike, it has never been noticeable, and only the investigations carried on with coloured rings by Mr. J. P. Burkitt have enabled it to be proved true of them also.

[2] The white wagtail is a passage-migrant, breeding in small numbers, but the species here intended is the pied ; the yellow wagtail is also absent in winter, and this record is undoubtedly a mistake for the grey, a resident at Selborne throughout the year.

[3] It is now very unusual for the wheatear to winter with us ; a discussion on the point will be found on page 64.

[4] The Seven Years War, which added India and Canada to the British Empire.

[5] Fredric Hasselquist was one of the pupils sent out by Linnæus to investigate the natural history of distant countries. His province was Egypt, Syria, and Palestine.

[6] Actually it seems that very few of these small migrants from England do winter in Spain ; not only the climate, but competition of the native birds for a limited food supply, has to be taken into account.

LETTER XIV

TO THE SAME

Selborne, *March* 12, 1768.

Dear Sir,

If some curious gentleman would procure the head of a fallow-deer, and have it dissected, he would find it furnished with two spiracula, or breathing-places, besides the nostrils ; probably analogous to the *puncta lachrymalia* in the human head. When deer are thirsty they plunge their noses, like some horses, very deep under water, while in the act of drinking, and continue them in that situation for a considerable time : but, to obviate any inconveniency, they can open two vents, one at the inner corner of each eye, having a communication with the nose.[1] Here seems to be an extraordinary provision of nature worthy our attention ; and which has not, that I know of, been noticed by any naturalist. For it looks as if these creatures would not be suffocated, though both their mouths and nostrils were stopped. This curious formation of the head may be of singular service to beasts of chase, by affording them free respiration : and no doubt these additional nostrils are thrown open

when they are hard run.* Mr. *Ray* observed that, at *Malta*, the owners slit up the nostrils of such asses as were hard worked: for they, being naturally strait or small, did not admit air sufficient to serve them when they travelled, or laboured, in that hot climate. And we know that grooms, and gentlemen of the turf, think large nostrils necessary, and a perfection, in hunters and running horses.

Oppian, the *Greek* poet, by the following line, seems to have had some notion that stags have four spiracula:

"*Τετραδυμοι ῥινες, πισυρες πνοιησι διαυλοι.*"
"Quadrifidæ nares, quadruplices ad respirationem canales."
Opp., *Cyn.*, Lib. ii., l. 181.

Writers, copying from one another, make *Aristotle* say that goats breathe at their ears; whereas he asserts just the contrary:—
"*Αλκμαιων γαρ ουκ αληθη λεγει, φαμενος αναπνειν τας αιγας κατα τα ωτα.*"
"*Alcmæon* does not advance what is true, when he avers that goats "breathe through their ears."—History of Animals, Book I., chap. xi.

[1] There is no communication and consequently any aid to breathing is out of the question as a function for these sacs, which serve to secrete scent.

LETTER XV

TO THE SAME

Selborne, *March* 30, 1768.

Dear Sir,

Some intelligent country people have a notion that we have, in these parts, a species of the *genus mustelinum*, besides the weasel, stoat, ferret, and polecat; a little reddish beast, not much bigger than a field mouse, but much longer, which they call a *cane*.[1] This piece of intelligence can be little depended on; but farther inquiry may be made.

* In answer to this account, Mr. *Pennant* sent me the following curious and pertinent reply. "I was much surprised to find in the *antelope* something analogous "to what you mention as so remarkable in deer. This animal also has a long slit "beneath each eye, which can be opened and shut at pleasure. On holding an "orange to one, the creature made as much use of those orifices as of his nostrils, "applying them to the fruit, and seeming to smell it through them."

A gentleman in this neighbourhood had two milkwhite rooks in one nest. A booby of a carter, finding them before they were able to fly, threw them down and destroyed them, to the regret of the owner, who would have been glad to have preserved such a curiosity in his rookery. I saw the birds myself nailed against the end of a barn, and was surprised to find that their bills, legs, feet, and claws were milkwhite.

A shepherd saw, as he thought, some white larks on a down above my house this winter: were not these the *emberiza nivalis*, the snow-flake of the *Brit. Zool.*? No doubt they were.

A few years ago I saw a cock bullfinch in a cage, which had been caught in the fields after it was come to it's full colours. In about a year it began to look dingy; and, blackening every succeeding year, it became coal-black at the end of four. It's chief food was hempseed. Such influence has food on the colour of animals! The pied and mottled colours of domesticated animals are supposed to be owing to high, various, and unusual food.

I had remarked, for years, that the root of the cuckoo-pint (*arum*) was frequently scratched out of the dry banks of hedges, and eaten in severe snowy weather. After observing, with some exactness, myself, and getting others to do the same, we found it was the thrush kind that searched it out. The root of the *arum* is remarkably warm and pungent.

Our flocks of female chaffinches have not yet forsaken us. The blackbirds and thrushes are very much thinned down by that fierce weather in *January*.

In the middle of *February* I discovered, in my tall hedges, a little bird [2] that raised my curiosity: it was of that yellow-green colour that belongs to the *salicaria* kind, and, I think, was soft-billed. It was no *parus*; and was too long and too big for the golden-crowned wren, appearing most like the largest willow-wren. It hung sometimes with it's back downwards, but never continuing one moment in the same place. I shot at it, but it was so desultory that I missed my aim.

I wonder that the stone curlew, *charadrius oedicnemus*, should

be mentioned by the writers as a rare bird: it abounds in all the campaign parts of *Hampshire* and *Sussex*, and breeds, I think, all the summer, having young ones, I know, very late in the autumn. Already they begin clamouring in the evening. They cannot, I think, with any propriety, be called, as they are by Mr. *Ray*, "*circa aquas versantes*"; for with us, by day at least, they haunt only the most dry, open, upland fields and sheep walks, far removed from water: what they may do in the night I cannot say. Worms are their usual food, but they also eat toads and frogs.

I can show you some good specimens of my *new mice*. *Linnæus*, perhaps, would call the species *mus minimus*.

[1] The rumour of another species arose from the fact that the female weasel is often extremely small. The ferret is only a domesticated form of the polecat, and that species has long been extinct in southern England. If there was a further local species at this period it was the pine-marten, which was extinct in Hampshire by about 1850.

[2] There is hardly a vestige of doubt that this bird was either a siskin or a wintering chiffchaff, these being the only two little greenish birds (except the goldcrest, which is ruled out) at all likely to be seen hopping about in a hedge at that season. Most editors who express any opinion pronounce it a chiffchaff; the siskin seems much more likely for these reasons. If "that fierce weather in January," mentioned in the previous sentence, was severe enough to thin out the blackbirds and thrushes so conspicuously, it would almost certainly have killed any wintering chiffchaffs. The author is careful to record a doubt whether it was soft-billed—the original MS. reads "and, as far as I could see, was soft-billed"—he evidently did not get a satisfactory view of the bill, and that cannot be taken as evidence. He says it looked most like the largest willow-wren—the wood-wren—and since in build the three willow-wrens are similar any resemblance to the willow-wren rather than the others must have lain in the plumage. Now, the wood-wren differs from the other two in showing yellow at the base of the tail and on the folded wing, and a broader yellow eye-stripe; it is precisely at these points that the greenish upper plumage of the siskin is broken by yellow, so that on an imperfect glimpse the superficial resemblance may be strong. He notes moreover as something unusual that it hung with its back downwards; the willow-wrens are by no means fond of this position, but the siskin is—so much so that even at a casual view the trait would be likely to attract attention. He dwells on its extreme restlessness, and is emphatic that it was no *parus*, disposing of an unspoken objection much more likely to occur after watching such a tit-like bird as a siskin than a delicate warbler. Finally, the mathematical chances on a bird of this description seen in February after hard weather must be quite a thousand to one in favour of the siskin, which now occurs in numbers at that season near Selborne.

LETTER XVI

TO THE SAME

Selborne, *April* 18, 1768.

DEAR SIR,

THE history of the stone curlew, *charadrius oedicnemus*, is as follows. It lays it's eggs, usually two, never more than three, on the bare ground, without any nest, in the field; so that the countryman, in stirring his fallows, often destroys them. The young run immediately from the egg like partridges, &c. and are withdrawn to some flinty field by the dam, where they skulk among the stones, which are their best security; for their feathers are so exactly of the colour of our grey spotted flints, that the most exact observer, unless he catches the eye of the young bird, may be eluded. The eggs are short and round; of a dirty white, spotted with dark bloody blotches. Though I might not be able, just when I pleased, to procure you a bird, yet I could show you them almost any day; and any evening you may hear them round the village, for they make a clamour which may be heard a mile. *Oedicnemus* is a most apt and expressive name for them, since their legs seem swoln[1] like those of a gouty man. After harvest I have shot them before the pointers in turnip fields.

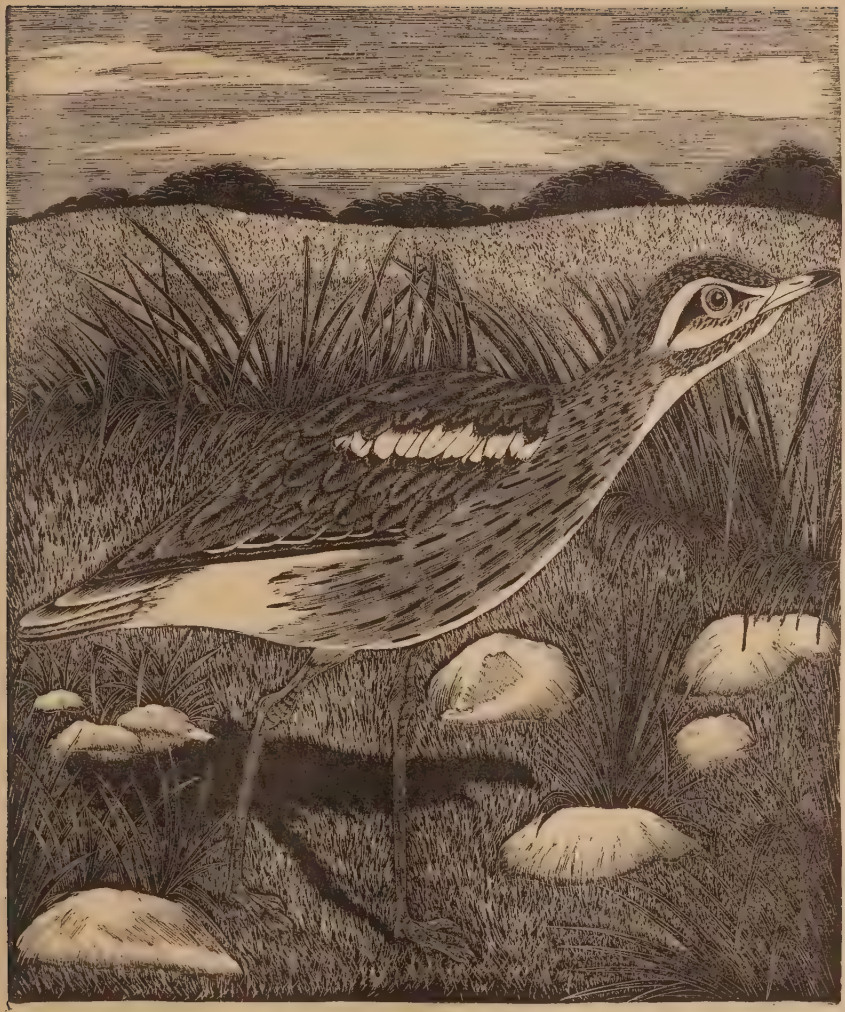
I make no doubt but there are three species of the *willow-wren*: two I know perfectly[2]; but have not been able yet to procure the third. No two birds can differ more in their notes, and that constantly, than those two that I am acquainted with; for the one has a joyous, easy, laughing note; the other a harsh loud chirp. The former is every way larger, and three quarters of an inch longer, and weighs two drams and an half; while the latter weighs but two: so the songster is one fifth heavier than the chirper. The chirper (being the first summer-bird of passage that is heard, the wryneck sometimes excepted) begins his two notes in the middle of *March*, and continues them through the spring and summer till the end of *August*, as appears by my journals. The legs of the larger of these two are flesh-coloured; of the less, black.

The *grasshopper-lark* began his sibilous note in my fields last *Saturday*.[3] Nothing can be more amusing than the whisper of this little bird, which seems to be close by though at an hundred yards distance; and, when close at your ear, is scarce any louder than when a great way off. Had I not been a little acquainted with insects, and known that the grasshopper kind is not yet hatched, I should have hardly believed but that it had been a *locusta* whispering in the bushes. The country people laugh when you tell them that it is the note of a bird. It is a most artful creature, sculking in the thickest part of a bush; and will sing at a yard distance, provided it be concealed. I was obliged to get a person to go on the other side of the hedge where it haunted; and then it would run, creeping like a mouse, before us for an hundred yards together, through the bottom of the thorns; yet it would not come into fair sight: but in a morning early, and when undisturbed, it sings on the top of a twig, gaping and shivering with it's wings. Mr. *Ray* himself had no knowledge of this bird, but received his account from Mr. *Johnson*, who apparently confounds it with the *reguli non cristati*, from which it is very distinct. See *Ray's Philos. Letters*, p. 108.

The fly-catcher (*stoparola*) has not yet appeared: it usually breeds in my vine. The *redstart* begins to sing: it's note is short and imperfect, but is continued till about the middle of *June*. The *willow-wrens* (the smaller sort) are horrid pests[4] in a garden, destroying the pease, cherries, currants, &c.; and are so tame that a gun will not scare them.

A List *of the* Summer Birds[5] *of* Passage *discovered in this neighbourhood, ranged somewhat in the Order in which they appear*:

	Linnæi Nomina.
Smallest willow-wren,	*Motacilla trochilus:*
Wryneck,	*Jynx torquilla:*
House-swallow,	*Hirundo rustica:*
Martin,	*Hirundo urbica:*
Sand-martin,	*Hirundo riparia:*
Cuckoo,	*Cuculus canorus:*



Nightingale,	*Motacilla luscinia :*
Blackcap,	*Motacilla atricapilla :*
Whitethroat,	*Motacilla sylvia :*
Middle willow-wren,	*Motacilla trochilus :*
Swift,	*Hirundo apus :*
Stone curlew ?,	*Charadrius oedicnemus ?*
Turtle-dove ?,	*Turtur aldrovandi ?*
Grasshopper-lark,	*Alauda trivialis :*
Landrail,	*Rallus crex :*
Largest willow-wren,	*Motacilla trochilus :*
Redstart,	*Motacilla phœnicurus :*
Goatsucker, or fern-owl,	*Caprimulgus europœus :*
Fly-catcher,	*Muscicapa grisola.*

My countrymen talk much of a bird that makes a clatter with it's bill against a dead bough, or some old pales, calling it a jar-bird. I procured one to be shot in the very fact ; it proved to be the *sitta europœa* (*the nuthatch*). Mr. *Ray* says that the less spotted *woodpecker* does the same. This noise may be heard a furlong or more.

Now is the only time to ascertain the short-winged summer birds ; for, when the leaf is out, there is no making any remarks on such a restless tribe ; and, when once the young begin to appear, it is all confusion : there is no distinction of genus, species, or sex.

In breeding-time snipes play over the moors, piping and humming : they always hum as they are descending. Is not their hum ventriloquous like that of the turkey ? Some suspect it is made by their wings.[6]

This morning I saw the golden-crowned wren, whose crown glitters like burnished gold. It often hangs like a titmouse, with it's back downwards.

Yours, &c., &c.

[1] This is a special characteristic of birds of the year.

[2] The willow-wren (here termed the songster), and the chiffchaff (here termed the chirper). The third, the wood-wren, was already known to the author, but was only satisfactorily identified during the ensuing summer.

[3] April 16th, a fairly early date for the grasshopper-warbler.

[4] It remains to be satisfactorily proved that any of the three willow-wrens take fruit, and they certainly cannot be described as pests, for they are mainly, if not entirely, useful insectivorous birds. Probably the object of their activities was misjudged ; or the depredations may have been caused by some other bird, perhaps the rather similar garden warbler, which is destructive at currant-time.

[5] The *smallest willow-wren* in this list is the chiffchaff, the *middle willow-wren* the willow-wren proper, and the *largest willow-wren* the wood-wren. *Alauda trivialis* was the Linnean name for the tree-pipit (a bird not distinguished by the author from the closely related meadow-pipit), and not for the grasshopper-warbler, which Linnæus did not know.

[6] The humming or drumming of the snipe is caused by the two outer tail feathers which may be seen standing stiffly out during the descent ; some observers believe that the primaries are also partly responsible.

LETTER XVII

TO THE SAME

Selborne, *June* 18, 1768.

Dear Sir,

On *Wednesday* last arrived your agreeable letter of *June* the 10th. It gives me great satisfaction to find that you pursue these studies still with such vigour, and are in such forwardness with regard to reptiles and fishes.

The reptiles, few as they are, I am not acquainted with, so well as I could wish, with regard to their natural history. There is a degree of dubiousness and obscurity attending the propagation of this class of animals, something analogous to that of the *cryptogamia* in the sexual system of plants : and the case is the same with regard to some of the fishes ; as the eel, &c.

The method in which toads procreate and bring forth seems to be very much in the dark. Some authors say that they are viviparous : and yet *Ray* classes them among his oviparous [1] animals ; and is silent with regard to the manner of their bringing forth. Perhaps they may be *ἔσω μὲν ὠοτόκοι, ἔξω δὲ ζωοτόκοι*, as is known to be the case with the viper.

The copulation of frogs (or at least the appearance of it; for *Swammerdam* [2] proves that the male has no *penis intrans*) is notorious to every body: because we see them sticking upon each others' backs for a month together in the spring: and yet I never saw, or read, of toads being observed in the same situation. It is strange that the matter with regard to the venom of toads has not been yet settled. That they are not noxious to some animals is plain: for ducks, buzzards, owls, stone curlews, and snakes, eat them, to my knowledge, with impunity. And I well remember the time, but was not eye-witness to the fact (though numbers of persons were), when a quack, at this village, ate a toad to make the country-people stare; afterwards he drank oil.

I have been informed also, from undoubted authority, that some ladies (ladies you will say of peculiar taste) took a fancy to a toad, which they nourished summer after summer, for many years, till he grew to a monstrous size, with the maggots which turn to flesh flies. The reptile used to come forth every evening from an hole under the garden-steps; and was taken up, after supper, on the table to be fed. But at last a tame raven, kenning him as he put forth his head, gave him such a severe stroke with his horny beak as put out one eye. After this accident the creature languished for some time and died.

I need not remind a gentleman of your extensive reading of the excellent account there is from Mr. *Derham*, in *Ray's* Wisdom of God in the Creation (p. 365), concerning the migration of frogs from their breeding ponds. In this account he at once subverts that foolish opinion of their dropping from the clouds in rain; shewing that it is from the grateful coolness and moisture of those showers that they are tempted to set out on their travels, which they defer till those fall. Frogs are as yet in their tadpole state; but, in a few weeks, our lanes, paths, fields, will swarm for a few days with myriads of those emigrants, no larger than my little finger nail. *Swammerdam* gives a most accurate account of the method and situation in which the male impregnates the spawn of the female. How wonderful is

the œconomy of Providence with regard to the limbs of so vile a reptile! While it is an *aquatic* it has a fish-like tail, and no legs: as soon as the legs sprout, the tail drops off as useless, and the animal betakes itself to the land!

Merret,[3] I trust, is widely mistaken when he advances that the *rana arborea*[4] is an *English* reptile; it abounds in *Germany* and *Switzerland*.

It is to be remembered that the *salamandra aquatica* of *Ray* (the water-newt or eft) will frequently bite at the angler's bait, and is often caught on his hook. I used to take it for granted that the *salamandra aquatica* was hatched, lived, and died, in the water. But *John Ellis*, Esq. F.R.S. (the coralline *Ellis*[5]) asserts, in a letter to the Royal Society, dated *June* the 5th, 1766, in his account of the *mud inguana*, an amphibious *bipes* from *South Carolina*, that the water-eft, or newt, is only the *larva* of the land-eft, as tadpoles are of frogs. Lest I should be suspected to misunderstand his meaning, I shall give it in his own words. Speaking of the *opercula* or coverings to the gills of the *mud inguana*, he proceeds to say that "The form "of these pennated coverings approach very near to what I have some "time ago observed in the *larva* or *aquatic* state of our *English lacerta*, "known by the name of eft, or newt; which serve them for coverings "to their gills, and for fins to swim with while in this state; and "which they lose, as well as the fins of their tails, when they *change* "their state and *become land animals*, as I have observed, by keeping "them alive for some time myself."

Linnæus, in his *Systema Naturæ*, hints at what Mr. *Ellis* advances more than once.

Providence has been so indulgent to us as to allow of but one venomous reptile of the serpent kind in these kingdoms, and that is the viper. As you propose the good of mankind to be an object of your publications, you will not omit to mention common sallad-oil as a sovereign remedy against the bite of the viper. As to the blind worm (*anguis fragilis*, so called because it snaps in sunder with a small blow), I have found, on examination, that it is perfectly innocu-

ous. A neighbouring yeoman (to whom I am indebted for some good hints) killed and opened a female viper about the twenty-seventh of *May*: he found her filled with a chain of eleven eggs, about the size of those of a blackbird; but none of them were advanced so far towards a state of maturity as to contain any rudiments of young. Though they are oviparous, yet they are viviparous also, hatching their young within their bellies, and then bringing them forth. Whereas snakes [6] lay chains of eggs every summer in my melon beds, in spite of all that my people can do to prevent them; which eggs do not hatch till the spring following, as I have often experienced. Several intelligent folks assure me that they have seen the viper open her mouth and admit her helpless young down her throat [7] on sudden surprises, just as the female opossum does her brood into the pouch under her belly, upon the like emergencies; and yet the *London* viper-catchers insist on it, to Mr. *Barrington*, that no such thing ever happens. The serpent kind eat, I believe, but once in a year; or, rather, but only just at one season of the year. Country people talk much of a water-snake, but, I am pretty sure, without any reason; for the common snake (*coluber natrix*) delights much to sport in the water, perhaps with a view to procure frogs and other food.

I cannot well guess how you are to make out your twelve species of reptiles,[8] unless it be by the various species, or rather varieties, of our *lacerti*, of which *Ray* enumerates five. I have not had opportunity of ascertaining these; but remember well to have seen, formerly, several beautiful green *lacerti* on the sunny sandbanks near *Farnham*, in *Surrey*; and *Ray* admits there are such in *Ireland*.

[1] Toads are oviparous, and their bead-like spawn is deposited in ponds in long chains. The contrast here attempted between the reproduction of toads and frogs is not valid. The "venom" is exuded from the skin on irritation; it is caustic, viscid, and inflammable. On many small creatures its effect is fatal, but various predatory animals certainly eat toads with impunity.

[2] Jan Jacobz Swammerdam (1637–80) of Amsterdam, one of the most accurate, enthusiastic and industrious of the early biologists. He was the first to unravel such transformations as those of caterpillars into butterflies, and tadpoles into frogs, over

which he carried on and won a long controversy against Harvey, who discovered the circulation of the blood. Most of his observations remained in MS. for nearly sixty years after his death. The great merit of his work is its detail and exactitude ; his skill at minute dissections was outstanding.

[3] Christopher Merret (1619–95), an Oriel man and one of the first members of the Royal Society, was a friend of Harvey, who put him in charge of his library and museum when he presented it to the Royal College of Physicians in 1654. These, together with Merret's house, were destroyed in the Fire of London (1666), which also seems to have accounted for the first edition of his book *Pinax Rerum Naturalium Britannicum*—a sort of catalogue of native animals, vegetables, and minerals, possessing no great value.

[4] The only undoubtedly indigenous British frog is the common *Rana temporaria* ; but in certain localities, particularly in East Anglia, colonies exist of the European *R. esculenta*. Most, if not all of these, are the result of recent introduction by man. The tree-frog (*Hyla arborea*) has been introduced into the Isle of Wight.

[5] John Ellis (1710?–76) made his reputation by publishing in 1755 " An Essay towards the Natural History of the Corallines ", in which he proved the animal nature of coral. In the year that this letter was written he was awarded the Copley Medal of the Royal Society. He was a particularly cautious and penetrating observer ; Linnæus called him " the main support of natural history in England ".

[6] Not snakes generally, but simply grass-snakes.

[7] That the viper swallows her young is still widely believed, though no competent naturalist has ever brought forward a satisfactory record, and rewards which have been offered for the submission of specimens with the young, thus admitted, still inside them, have never been successfully claimed.

[8] We have only six indigenous specimens of reptiles : the sand-lizard and the common or viviparous lizard, the blind-worm or slow-worm, the viper or adder, the grass or ringed snake, and the rare smooth snake. Pennant's edition of the following year actually makes out thirteen : the viper, grass-snake, blind-worm, five lizards (the scaly, warty—a newt—brown, little brown, and snake-shaped), the spinous tortoise, and the frog, edible frog, natterjack and toad, which last are now classed as Amphibians. The tortoise and three of the lizards are imaginary.

LETTER XVIII

TO THE SAME

Selborne, *July* 27, 1768.

DEAR SIR,

I RECEIVED your obliging and communicative letter of *June* the 28th, while I was on a visit at a gentleman's house, where I had neither

books to turn to, nor leisure to sit down, to return you an answer to many queries, which I wanted to resolve in the best manner that I am able.

A person, by my order, has searched our brooks, but could find no such fish as the *gasterosteus pungitius*: he found the *gasterosteus aculeatus* in plenty. This morning, in a basket, I packed a little earthen pot full of wet moss, and in it some sticklebacks, male and female; the females big with spawn; some lamperns; some bulls heads; but I could procure no minnows. This basket will be in *Fleet-street* by eight this evening; so I hope *Mazel*[1] will have them fresh and fair to-morrow morning. I gave some directions, in a letter, to what particulars the engraver should be attentive.

Finding, while I was on a visit, that I was within a reasonable distance of *Ambresbury*, I sent a servant over to that town, and procured several living specimens of loaches, which he brought, safe and brisk, in a glass decanter. They were taken in the gullies that were cut for watering the meadows. From these fishes (which measured from two to four inches in length) I took the following description: "The loach, in it's general aspect, has a pellucid "appearance: it's back is mottled with irregular collections of "small black dots, not reaching much below the *linea lateralis*, as "are the back and tail fins: a black line runs from each eye down "to the nose; it's belly is of a silvery white; the upper jaw projects "beyond the lower, and is surrounded with six feelers, three on "each side: it's pectoral fins are large, it's ventral much smaller; "the fin behind it's anus small; it's dorsal-fin large, containing eight "spines; it's tail, where it joins to the tail-fin, *remarkably broad*, "without any taperness, so as to be characteristic of this genus: "the tail-fin is broad, and square at the end. From the breadth and "muscular strength of the tail it appears to be an active nimble "fish."

In my visit I was not very far from *Hungerford*, and did not forget to make some inquiries concerning the wonderful method of curing cancers by means of toads. Several intelligent persons,

both gentry and clergy, do, I find, give a great deal of credit to what was asserted in the papers: and I myself dined with a clergyman who seemed to be persuaded that what is related is matter of fact; but, when I came to attend to his account, I thought I discerned circumstances which did not a little invalidate the woman's story of the manner in which she came by her skill. She says of herself "that, labouring under a virulent cancer, she went to some church where there was a vast crowd: on going into a pew, she was accosted by a strange clergyman; who, after expressing compassion for her situation, told her that if she would make such an application of living toads as is mentioned she would be well". Now is it likely that this unknown gentleman should express so much tenderness for this single sufferer, and not feel any for the many thousands that daily languish under this terrible disorder? Would he not have made use of this invaluable nostrum for his own emolument; or, at least, by some means of publication or other, have found a method of making it public for the good of mankind? In short, this woman (as it appears to me) having set up for a cancer-doctress, finds it expedient to amuse the country with this dark and mysterious relation.

The water-eft has not, that I can discern, the least appearance of any gills,[2] for want of which it is continually rising to the surface of the water to take in fresh air. I opened a big-bellied one indeed, and found it full of spawn. Not that this circumstance at all invalidates the assertion that they are *larvæ*: for the *larvæ* of insects are full of eggs, which they exclude the instant they enter their last state. The water-eft is continually climbing over the brims of the vessel, within which we keep it in water, and wandering away: and people every summer see numbers crawling out of the pools where they are hatched, up the dry banks. There are varieties of them, differing in colour; and some have fins up their tail and back, and some have not.

[1] Peter Mazell, who afterwards executed some plates for the first edition of *Selborne*.

[2] The reason is that our three newts, or "efts", are terrestrial except in the breeding season, when they take to the water. But the young, which begin as tadpoles, have external gills for a few months. The "fins", frills, or crests are not characteristic of any species, but of the males of all three during the breeding season.

LETTER XIX

TO THE SAME

Selborne, *Aug.* 17, 1768.

DEAR SIR,

I HAVE now, past dispute, made out three distinct species of the willow-wrens (*motacillæ trochili*) which *constantly* and *invariably* use distinct notes. But, at the same time, I am obliged to confess that I know nothing of your willow-lark.* In my letter of *April* the 18th, I had told you peremptorily that I knew your willow-lark, but had not seen it then: but, when I came to procure it, it proved, in all respects, a very *motacilla trochilus*; only that it is a size larger than the two other, and the yellow-green of the whole upper part of the body is more vivid, and the belly of a clearer white.[1] I have specimens of the three sorts now lying before me; and can discern that there are three gradations of sizes, and that the least has black legs, and the other two flesh-coloured ones. The yellowest bird is considerably the largest, and has it's quill-feathers and secondary feathers tipped with white, which the others have not. This last haunts only the tops of trees in high beechen woods, and makes a sibilous grasshopper-like noise, now and then, at short intervals, shivering a little with its wings when it sings; and is, I make no doubt now, the *regulus non cristatus* of *Ray*; which he says "*cantat voce stridulâ locustæ*".[2] Yet this great ornithologist never suspected that there were three species.

[1] This was a wood-wren; the description of its salient points could not easily be improved on.

[2] "It sings with the chirping voice of a grasshopper."

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* Brit. Zool. edit. 1776, octavo, p. 381.

LETTER XX

TO THE SAME

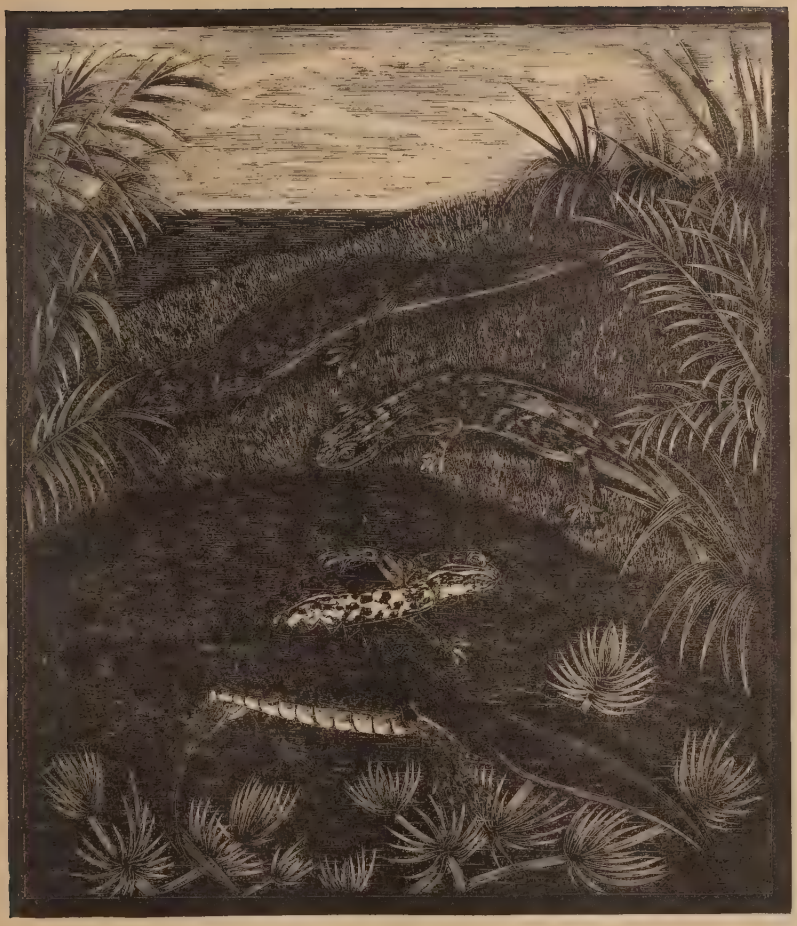
Selborne, *October* 8, 1768.

It is, I find, in *zoology* as it is in *botany*: all nature is so full, that that district produces the greatest variety which is the most examined. Several birds, which are said to belong to the north only, are, it seems, often in the south. I have discovered this summer three species of birds with us, which writers mention as only to be seen in the northern counties. The first that was brought me (on the 14th of *May*) was the sandpiper,[1] *tringa hypoleucus*: it was a cock bird, and haunted the banks of some ponds near the village; and, as it had a companion, doubtless intended to have bred near that water. Besides, the owner has told me since, that, on recollection, he has seen some of the same birds round his ponds in former summers.

The next bird that I procured (on the 21st of *May*) was a male red-backed butcher bird,[2] *lanius collurio*. My neighbour, who shot it, says that it might easily have escaped his notice, had not the outcries and chattering of the white-throats and other small birds drawn his attention to the bush where it was: it's craw was filled with the legs and wings of beetles.

The next rare birds (which were procured for me last week) were some ring-ousels, *turdi torquati*.

This week twelve months a gentleman from *London*, being with us, was amusing himself with a gun, and found, he told us, on an old yew hedge where there were berries, some birds like blackbirds, with rings of white round their necks: a neighbouring farmer also at the same time observed the same; but, as no specimens were procured, little notice was taken. I mentioned this circumstance to you in my letter of *November* the 4th, 1767: (you however paid but small regard to what I said, as I had not seen these birds myself): but last week the aforesaid farmer, seeing a large flock, twenty or thirty of these birds, shot two cocks and two hens: and says, on recollection, that he remembers to have observed these



birds again last spring, about *Lady-day*, as it were, on their return to the north. Now perhaps these ousels [3] are not the ousels of the north of *England*, but belong to the more northern parts of *Europe*; and may retire before the excessive rigor of the frosts in those parts; and return to breed in the spring, when the cold abates. If this be the case, here is discovered a new bird of winter passage, concerning whose migrations the writers are silent: but if these birds should prove the ousels of the north of *England*, then here is a migration disclosed within our own kingdom never before remarked. It does not yet appear whether they retire beyond the bounds of our island to the south; but it is most probable that they usually do, or else one cannot suppose that they would have continued so long unnoticed in the southern counties. The ousel is larger than a blackbird, and feeds on haws; but last autumn (when there were no haws) it fed on yew-berries: in the spring it feeds on ivy-berries, which ripen only at that season, in *March* and *April*.

I must not omit to tell you (as you have been so lately on the study of reptiles) that my people, every now and then of late, draw up with a bucket of water from my well, which is 63 feet deep, a large black warty lizard [4] with a fin-tail and yellow belly. How they first came down at that depth, and how they were ever to have got out thence without help, is more than I am able to say.

My thanks are due to you for your trouble and care in the examination of a buck's head. As far as your discoveries reach at present, they seem much to corroborate my suspicions; and I hope Mr. —— [5] may find reason to give his decision in my favour; and then, I think, we may advance this extraordinary provision of nature as a new instance of the wisdom of God in the creation.

As yet I have not quite done with my history of the *oedicnemus*, or stone-curlew; for I shall desire a gentleman in *Sussex* [6] (near whose house these birds congregate in vast flocks in the autumn) to observe nicely when they leave him, (if they do leave him) and when they return again in the spring: I was with this gentleman lately, and saw several single birds.

[1] The common sandpiper, though best known as a breeding species in the north and west, visits south-east England regularly on passage, and habitually travels in pairs. It does occasionally breed, even in this part, but these would probably be birds simply halting on their northward journey.

[2] The red-backed shrike is a summer visitor to England and Wales, and far from being a northern bird ; in fact, north of Derby it becomes extremely scarce. It is now not uncommon in the Selborne neighbourhood, but is subject to striking local fluctuations.

[3] The ring-ousel is a summer visitor to the mountains and fells of the north and west ; in the south it occurs only on passage. The movement consists principally of native birds, but some pass through on their way to other parts of Europe. The winter quarters are in the Mediterranean lands.

[4] A great crested newt.

[5] John Hunter, the celebrated anatomist and surgeon (1728–93), who had been elected F.R.S. the year before, and was at the beginning of his fame.

[6] John Woods of Chilgrove, near Chichester, brother of Henry Woods, who married the author's sister Rebecca.

LETTER XXI

TO THE SAME

Selborne, *Nov.* 28, 1768.

Dear Sir,

With regard to the *oedicnemus*, or stone-curlew, I intend to write very soon [1] to my friend near *Chichester*, in whose neighbourhood these birds seem most to abound ; and shall urge him to take particular notice when they begin to congregate, and afterwards to watch them most narrowly whether they do not withdraw themselves during the dead of the winter. When I have obtained information with respect to this circumstance, I shall have finished my history of the *stone-curlew* ; which I hope will prove to your satisfaction, as it will be, I trust, very near the truth. This gentleman, as he occupies a large farm of his own, and is abroad early and late, will be a very proper spy upon the motions of these birds : and besides, as I have prevailed on him to buy the Naturalist's Journal [2] (with which he is much delighted), I shall expect that he will be very exact

in his dates. It is very extraordinary, as you observe, that a bird so common with us should never straggle to you.

And here will be the properest place to mention, while I think of it, an anecdote [3] which the above-mentioned gentleman told me when I was last at his house; which was that, in a warren joining to his outlet, many daws (*corvi monedulæ*) build every year in the rabbit-burrows under ground. The way he and his brothers used to take their nests, while they were boys, was by listening at the mouths of the holes; and, if they heard the young ones cry, they twisted the nest out with a forked stick. Some water-fowls (*viz.* the puffins) breed, I know, in that manner; but I should never have suspected the daws of building in holes on the flat ground.

Another very unlikely spot is made use of by daws as a place to breed in, and that is *Stonehenge*. These birds deposit their nests in the interstices between the upright and the impost stones of that amazing work of antiquity: which circumstance alone speaks the prodigious height of the upright stones, that they should be tall enough to secure those nests from the annoyance of shepherd-boys, who are always idling round that place.

One of my neighbours last *Saturday, November* the 26th, saw a martin in a sheltered bottom: the sun shone warm, and the bird was hawking briskly after flies. I am now perfectly satisfied that they do not all leave this island in the winter.

You judge very right, I think, in speaking with reserve and caution concerning the cures done by toads: for, let people advance what they will on such subjects, yet there is such a propensity in mankind towards deceiving and being deceived, that one cannot safely relate any thing from common report, especially in print, without expressing some degree of doubt and suspicion.

Your approbation, with regard to my new discovery of the migration of the ring-ousel, gives me satisfaction; and I find you concur with me in suspecting that they are foreign birds which visit us. You will be sure, I hope, not to omit to make inquiry whether your ring-ousels leave your rocks in the autumn. What

puzzles me most, is the very short stay they make with us; for in about three weeks they are all gone. I shall be very curious to remark whether they will call on us at their return in the spring, as they did last year.

I want to be better informed with regard to ichthyology. If fortune had settled me near the sea-side, or near some great river, my natural propensity would have soon urged me to have made myself acquainted with their productions: but as I have lived mostly in inland parts, and in an upland district, my knowledge of fishes extends little farther than to those common sorts which our brooks and lakes produce.

I am, &c.

[1] The apparent error of writing for observations on stone-curlew migration at a season when all but a few stragglers have long gone south is due to a curious alteration in the text; according to the original correspondence this request had already been made by October 8th—probably on Michaelmas Day, when the author visited John Woods on his journey to see the Moose at Goodwood described in Letter XXVIII.

[2] *The Naturalist's Journal. Printed for W. Sandby, Fleet Street, London,* 1767, *Price One Shilling and Sixpence.* It was "invented" by Daines Barrington and a copy presented to the author, who from this time onwards used it in successive volumes for recording his observations, writing as a motto on the flyleaf a quotation from Thomson's *Seasons*:

> . . . I solitary court
> Th' inspiring breeze; and meditate the book
> Of Nature ever open . . .

[3] In the old sense of something unpublished.

LETTER XXII

TO THE SAME

Selborne, *Jan.* 2, 1769.

Dear Sir,

As to the peculiarity of jackdaws building with us under the ground in rabbit-burrows, you have, in part, hit upon the reason; for, in

reality, there are hardly any towers or steeples [1] in all this country. And perhaps, *Norfolk* excepted, *Hampshire* and *Sussex* are as meanly furnished with churches as almost any counties in the kingdom. We have many livings of two or three hundred pounds a year, whose houses of worship make little better appearance than dovecots. When I first saw *Northamptonshire, Cambridgeshire* and *Huntingdonshire,* and the fens of *Lincolnshire,* I was amazed at the number of spires which presented themselves in every point of view. As an admirer of prospects, I have reason to lament this want in my own country; for such objects are very necessary ingredients in an elegant landscape.

What you mention with respect to reclaimed toads raises my curiosity. An ancient author, though no naturalist, has well remarked that "*Every kind of beasts, and of birds, and of serpents, and things* "*in the sea, is tamed, and hath been tamed, of mankind*".*

It is a satisfaction to me to find that a green lizard [2] has actually been procured for you in *Devonshire*; because it corroborates my discovery, which I made many years ago, of the same sort, on a sunny sandbank near *Farnham* in *Surrey*. I am well acquainted with the south hams of *Devonshire*; and can suppose that district, from its southerly situation, to be a proper habitation for such animals in their best colours.

Since the ring-ousels of your vast mountains do certainly not forsake them against winter,[3] our suspicions that those which visit this neighbourhood about *Michaelmas* are not *English* birds, but driven from the more northern parts of *Europe* by the frosts, are still more reasonable; and it will be worth your pains to endeavour to trace from whence they come, and to inquire why they make so very short a stay.

In your account of your error with regard to the two species of herons, you incidentally gave me great entertainment in your description of the heronry at *Cressi-hall,*[4] which is a curiosity I never could manage to see. Fourscore nests of such a bird on one tree is a rarity which I would ride half as many miles to have a sight of.

* *James,* chap. iii. 7.

Pray be sure to tell me in your next whose seat *Cressi-hall* is, and near what town it lies.* I have often thought that those vast extents of fens have never been sufficiently explored. If half a dozen gentlemen, furnished with a good strength of water-spaniels, were to beat them over for a week, they would certainly find more species.

There is no bird, I believe, whose manners I have studied more than that of the *caprimulgus* (the goat-sucker), as it is a wonderful and curious creature: but I have always found that though sometimes it may chatter as it flies, as I know it does, yet in general it utters it's jarring note sitting on a bough; and I have for many an half hour watched it as it sat with it's under mandible quivering, and particularly this summer. It perches usually on a bare twig, with it's head lower than it's tail, in an attitude well expressed by your draughtsman in the folio *British Zoology*. This bird is most punctual in beginning it's song exactly at the close of day; so exactly that I have known it strike up more than once or twice just at the report of the *Portsmouth* evening gun, which we can hear when the weather is still. It appears to me past all doubt that it's notes are formed by organic impulse, by the powers of the parts of it's windpipe, formed for sound, just as cats pur. You will credit me, I hope, when I assure you that, as my neighbours were assembled in an hermitage [5] on the side of a steep hill where we drink tea, one of these churn-owls came and settled on the cross of that little straw edifice and began to chatter, and continued his note for many minutes: and we were all struck with wonder to find that the organs of that little animal, when put in motion, gave a sensible vibration to the whole building! This bird also sometimes makes a small squeak, repeated four or five times; and I have observed that to happen when the cock has been pursuing the hen in a toying way through the boughs of a tree.

It would not be at all strange if your bat, which you have procured, should prove a new one, since five species have been found [6] in a neighbouring kingdom. The great sort that I mentioned is

* *Cressi-hall* is near *Spalding*, in *Lincolnshire*.

certainly a non-descript: I saw but one this summer, and that I had no opportunity of taking.

Your account of the *Indian-grass* was entertaining. I am no angler myself; but inquiring of those that are, what they supposed that part of their tackle to be made of? they replied "of the intestines of a silkworm".

Though I must not pretend to great skill in entomology, yet I cannot say that I am ignorant of that kind of knowledge: I may now and then perhaps be able to furnish you with a little information.

The vast rains ceased with us much about the same time as with you, and since we have had delicate weather. Mr. *Barker*, who has measured the rain for more than thirty years, says, in a late letter, that more has fallen this year than in any he ever attended to; though, from *July* 1763 to *January* 1764, more fell than in any seven months of this year.

[1] In some cases on record burrows have been definitely preferred to trees, although some of the greatest colonies of daws are in old parks with much decayed timber. Norfolk was unknown to the author; it is very far from being meanly furnished with churches, ranking with the first counties of England in that respect. Spires are most common and best developed in the plains, where no hills compete.

[2] The true continental green lizard (*Lacerta viridis*) is not found in this country except when imported by man; this was most probably a bright sand-lizard (*Lacerta agilis* Linn.). In the autumn of 1750 the author had spent several weeks in the South Hams—the part of Devon between Dartmoor and the sea—with his friend Nathan Wells, Rector of East Allington, near Kingsbridge.

[3] This assurance of Pennant's was almost undoubtedly mistaken, since wintering ring-ousels are exceptional. As no winter has elapsed since the point was raised he must have given the information offhand, without having had the opportunity to verify it.

[4] Pennant describes it publicly in his *Tour in Scotland*; the herons, he says, "are numerous as Rooks, and their nests are crowded together, that myself, and the company there was with me, counted no less than eighty in one spreading oak. I here had opportunity of detecting my own mistake, and that of other Ornithologists, in making two species of herons; for I found that the crested Heron was only the male of the other. . . ." Cressy Hall, near Spalding in Lincolnshire, the seat of the Heron family, who took pride in the possession of their namesake birds, was burnt down two years after *Selborne* was first published, and is now a farmhouse; the heronry was dispersed at the same time.

[5] "The Hermitage" was an arbour-like erection with a conical thatched roof surmounted by a rude cross which stood near the Zig-Zag up the Hanger, and is mentioned in the *Invitation to Selborne*.

[6] Twelve British species are now known.

LETTER XXIII

TO THE SAME

Selborne, *February* 28, 1769.

Dear Sir,

It is not improbable that the *Guernsey* lizard and our green lizards may be specifically the same; all that I know is, that, when some years ago many *Guernsey* lizards were turned loose in *Pembroke* college garden, in the university of *Oxford*, they lived a great while, and seemed to enjoy themselves very well, but never bred. Whether this circumstance will prove any thing either way I shall not pretend to say.

I return you thanks for your account of *Cressi-hall*; but recollect, not without regret, that in *June* 1746 I was visiting for a week together at *Spalding*, without ever being told that such a curiosity was just at hand. Pray send me word in your next what sort of tree it is that contains such a quantity of herons' nests; and whether the heronry consists of a whole grove or wood, or only of a few trees.

It gave me satisfaction to find that we accorded so well about the *caprimulgus*: all I contended for was to prove that it often chatters sitting as well as flying; and therefore the noise was voluntary, and from organic impulse, and not from the resistance of the air against the hollow of its mouth and throat.

If ever I saw any thing like actual migration, it was last *Michaelmas-day*. I was travelling,[1] and out early in the morning: at first there was a vast fog; but, by the time that I was got seven or eight miles from home towards the coast, the sun broke out into a delicate warm day. We were then on a large heath or common,

and I could discern, as the mist began to break away, great numbers of swallows (*hirundines rusticæ*) clustering on the stunted shrubs and bushes, as if they had roosted there all night. As soon as the air became clear and pleasant they all were on the wing at once; and, by a placid and easy flight, proceeded on southward towards the sea: after this I did not see any more flocks, only now and then a straggler.

I cannot agree with those persons that assert that the swallow kind disappear some and some gradually, as they come, for the bulk of them seem to withdraw at once: only some stragglers stay behind a long while, and do never, there is the greatest reason to believe, leave this island. Swallows seem to lay themselves up, and to come forth in a warm day, as bats do continually of a warm evening, after they have disappeared for weeks. For a very respectable gentleman assured me that, as he was walking with some friends under *Merton-wall* on a remarkably hot noon, either in the last week in *December* or the first week in *January*, he espied three or four swallows [2] huddled together on the moulding of one of the windows of that college. I have frequently remarked that swallows are seen later at *Oxford* than elsewhere: is it owing to the vast massy buildings of that place, to the many waters round it, or to what else?

When I used to rise in a morning last autumn, and see the swallows and martins clustering on the chimnies and thatch of the neighbouring cottages, I could not help being touched with a secret delight, mixed with some degree of mortification: with delight, to observe with how much ardour and punctuality those poor little birds obeyed the strong impulse towards migration, or hiding, imprinted on their minds by their great Creator; and with some degree of mortification, when I reflected that, after all our pains and inquiries, we are yet not quite certain to what regions they do migrate,[3] and are still farther embarrassed to find that some do not actually migrate at all.

These reflections made so strong an impression on my imagination, that they became productive of a composition that may perhaps

amuse you for a quarter of an hour when next I have the honour of writing to you.

[1] On the way to Goodwood to see the moose described in Letter XXVIII ; the heath where the swallows congregated was the Barnet above Prior's Dean.

[2] This informant, the Rev. Dr. Bosworth, was almost certainly mistaken ; the record as it stands is much too improbable to be accepted, although occasional instances of December swallows, and even of swallows wintering, have from time to time been authenticated.

[3] Many British swallows undoubtedly winter in South Africa, where seven birds marked in this country have been recovered, all on the east side. Another found on the Congo in December seems to indicate that some British native birds winter farther north.

LETTER XXIV

TO THE SAME

Selborne, *May* 29, 1769.

Dear Sir,

The *scarabæus fullo* [1] I know very well, having seen it in collections ; but have never been able to discover one wild in its natural state. Mr. *Banks* [2] told me he thought it might be found on the sea-coast.

On the thirteenth of *April* I went to the sheep-down, where the *ring-ousels* have been observed to make their appearance at spring and fall, in their way perhaps to the north or south ; and was much pleased to see three birds about the usual spot. We shot a cock and a hen ; they were plump and in high condition. The hen had but very small rudiments of eggs within her, which proves they are late breeders ; whereas those species of the thrush kind that remain with us the whole year have fledged young before that time. In their crops was nothing very distinguishable, but somewhat that seemed like blades of vegetables nearly digested. In autumn they feed on haws and yew-berries, and in the spring on ivy-berries. I dressed one of these birds, and found it juicy and

well-flavoured. It is remarkable that they make but a few days' stay in their spring visit, but rest near a fortnight at *Michaelmas*. These birds, from the observations of three springs and two autumns, are most punctual in their return; and exhibit a new migration unnoticed by the writers, who supposed they never were to be seen in any of the southern counties.

One of my neighbours lately brought me a new *salicaria*, which at first I suspected might have proved your willow-lark,* but, on a nicer examination, it answered much better to the description of that species which you shot at *Revesby*,[3] in *Lincolnshire*. My bird I describe thus: "It is a size less than the grasshopper-lark; "the head, back, and coverts of the wings, of a dusky brown, without "those dark spots of the grasshopper-lark; over each eye is a milk-"white stroke; the chin and throat are white, and the under parts "of a yellowish white; the rump is tawny, and the feathers of the "tail sharp-pointed; the bill is dusky and sharp, and the legs are "dusky; the hinder claw long and crooked". The person that shot it says that it sung so like a reed-sparrow that he took it for one; and that it sings all night: but this account merits farther inquiry. For my part, I suspect it is a second sort of *locustella*,[4] hinted at by Dr. *Derham* in *Ray's Letters*: see p. 108. He also procured me a grasshopper-lark.

The question that you put with regard to those genera of animals that are peculiar to *America*, viz. how they came there, and whence? is too puzzling for me to answer; and yet so obvious as often to have struck me with wonder. If one looks into the writers on that subject little satisfaction is to be found. Ingenious men will readily advance plausible arguments to support whatever theory they shall chuse to maintain; but then the misfortune is, every one's hypothesis is each as good as another's, since they are all founded on conjecture. The late writers of this sort, in whom may be seen all the arguments of those that have gone before, as I remember, stock *America* from the western coast of *Africa* and the south of *Europe*; and then break

* For this *salicaria* see letter *August* 30, 1769.

down the Isthmus that bridged over the *Atlantic*. But this is making use of a violent piece of machinery: it is a difficulty worthy of the interposition of a god! "*Incredulus odi.*"

TO THOMAS PENNANT, ESQUIRE

THE NATURALIST'S SUMMER-EVENING WALK

——equidem credo, quia sit divinitus illis
Ingenium. VIRG. Georg.

WHEN day declining sheds a milder gleam,
What time the may-fly * haunts the pool or stream;
When the still owl skims round the grassy mead,
What time the timorous hare limps forth to feed;
Then be the time to steal adown the vale,
And listen to the vagrant † cuckoo's tale;
To hear the clamorous ‡ curlew call his mate,
Or the soft quail his tender pain relate;
To see the swallow sweep the dark'ning plain
Belated, to support her infant train;
To mark the swift in rapid giddy ring
Dash round the steeple, unsubdu'd of wing:
Amusive birds!—say where your hid retreat
When the frost rages and the tempests beat;
Whence your return, by such nice instinct led,
When spring, soft season, lifts her bloomy head?
Such baffled searches mock man's prying pride,
The GOD of NATURE is your secret guide!

* The angler's may-fly, the *ephemera vulgata*, *Linn*, comes forth from its aurelia state, and emerges out of the water about six in the evening, and dies about eleven at night, determining the date of it's fly state in about five or six hours. They usually begin to appear about the 4th of *June*, and continue in succession for near a fortnight. See *Swammerdam*, *Derham*, *Scopoli*, *&c.*

† Vagrant cuckoo; so called because, being tied down by no incubation or attendance about the nutrition of it's young, it wanders without control.[5]

‡ *Charadrius oedicnemus.*

While deep'ning shades obscure the face of day
To yonder bench leaf-shelter'd, let us stray,
Till blended objects fail the swimming sight,
And all the fading landscape sinks in night;
To hear the drowsy dor come brushing by
With buzzing wing, or the shrill * cricket cry;
To see the feeding bat glance through the wood;
To catch the distant falling of the flood;
While o'er the cliff th' awaken'd churn-owl hung
Through the still gloom protracts his chattering song;
While high in air, and pois'd upon his wings,
Unseen, the soft enamour'd † woodlark sings:
These, NATURE'S works, the curious mind employ,
Inspire a soothing melancholy joy:
As fancy warms, a pleasing kind of pain
Steals o'er the cheek, and thrills the creeping vein!
Each rural sight, each sound, each smell, combine;
The tinkling sheep-bell, or the breath of kine;
The new-mown hay that scents the swelling breeze,
Or cottage-chimney smoking through the trees.
The chilling night-dews fall:—away, retire;
For see, the glow-worm lights her amorous fire! ‡
Thus, e'er night's veil had half obscur'd the sky,
Th' impatient damsel hung her lamp on high:
True to the signal, by love's meteor led,
Leander hasten'd to his Hero's bed.§

I am, &c.

* *Gryllus campestris.*

† In hot summer nights woodlarks soar to a prodigious height and hang singing in the air.

‡ The light of the female glow-worm (as she often crawls up the stalk of a grass to make herself more conspicuous) is a signal to the male, which is a slender dusky *scarabæus*.[6]

§ See the story of *Hero* and *Leander*.

[1] *Polyphylla fullo* Fabr., a close relation of the cockchafer, but not a British species.

[2] Joseph Banks, F.R.S.

[3] Where Pennant had visited Banks in May 1767.

[4] This bird was a sedge-warbler, as the excellent description makes clear.

[5] Cuckoos in the breeding season keep territory, and appear to wander only within their spheres of influence, although these sometimes overlap, as is proved by the cases of two hens laying in the same nest. A female's territory includes that of several males.

[6] All glow-worms of both sexes are phosphorescent, including the larvae and pupae.

LETTER XXV

TO THE SAME

Selborne, *Aug.* 30, 1769.

DEAR SIR,

IT gives me satisfaction to find that my account of the *ousel migration* pleases you. You put a very shrewd question when you ask me how I know that their autumnal migration is southward? Was not candour and openness the very life of natural history, I should pass over this query just as a sly commentator does over a crabbed passage in a classic; but common ingenuousness obliges me to confess, not without some degree of shame, that I only reasoned in that case from analogy. For as all other autumnal birds migrate from the northward to us, to partake of our milder winters, and return to the northward again when the rigorous cold abates, so I concluded that the ring-ousels did the same, as well as their congeners the fieldfares; and especially as ring-ousels are known to haunt cold mountainous countries: but I have good reason to suspect since that they may come to us from the westward; because I hear, from very good authority,[1] that they breed on *Dartmore*; and that they forsake that wild district about the time that our visitors appear, and do not return till late in the spring.

I have taken a great deal of pains about your *salicaria* and mine, with a white stroke over it's eye and a tawny rump. I have surveyed

it alive and dead, and have procured several specimens; and am perfectly persuaded myself (and trust you will soon be convinced of the same) that it is no more nor less than the *passer arundinaceus minor* of *Ray*. This bird, by some means or other, seems to be entirely omitted in the *British Zoology*; and one reason probably was because it is so strangely classed in *Ray*, who ranges it among his *picis affines*. It ought no doubt to have gone among his *aviculæ caudâ unicolore*, and among your slender-billed small birds of the same division. *Linnæus* might with great propriety have put it into his genus of *motacilla*; and the *motacilla salicaria* of his *fauna suecicâ* seems to come the nearest to it. It is no uncommon bird, haunting the sides of ponds and rivers where there is covert, and the reeds and sedges of moors. The country people in some places call it the *sedge-bird*. It sings incessantly night and day during the breeding-time, imitating the note of a sparrow, a swallow, a sky-lark; and has a strange hurrying manner in it's song. My specimens correspond most minutely to the description of your *fen salicaria* shot near *Revesby*. Mr. *Ray* has given an excellent characteristic of it when he says, "*Rostrum & pedes in hâc aviculâ multò majores sunt quàm pro corporis ratione.*" [2] See letter *May* 29, 1769.

I have got you the egg of an *oedicnemus*, or stone-curlew, which was picked up in a fallow on the naked ground: there were two; but the finder inadvertently crushed one with his foot before he saw them.

When I wrote to you last year on reptiles, I wish I had not forgot to mention the faculty that snakes have of stinking *se defendendo*. I knew a gentleman who kept a tame snake, which was in it's person as sweet as any animal while in good humour and unalarmed; but as soon as a stranger, or a dog or cat, came in, it fell to hissing, and filled the room with such nauseous effluvia as rendered it hardly supportable. Thus the squnck,[3] or stonck, of *Ray's Synop. Quadr.* is an innocuous and sweet animal; but, when pressed hard by dogs and men, it can eject such a most pestilent and fetid smell and excrement, that nothing can be more horrible.

A gentleman sent me lately a fine specimen [4] of the *lanius minor cinerascens cum maculâ in scapulis albâ, Raii*; which is a bird that, at the time of your publishing your two first volumes of *British Zoology*, I find you had not seen. You have described it well from *Edwards's* drawing.

[1] Probably the author's friend Sampson Newbery, Fellow of Exeter College, Oxford, who lived in Devon and supplied valuable information regarding its birds.

[2] "The bill and feet in this little bird are very large in proportion to its body." It was a sedge-warbler.

[3] The skunk.

[4] A hen woodchat, shot on May 22nd at Well-head by Farmer Hoare's son, while washing herself. She was accompanied by a cock. This shrike is only an occasional visitant to the British Isles.

LETTER XXVI

TO THE SAME

Selborne, *December* 8, 1769.

DEAR SIR,

I WAS much gratified by your communicative letter on your return from *Scotland*, where you spent, I find, some considerable time, and gave yourself good room to examine the natural curiosities of that extensive kingdom, both those of the islands, as well as those of the highlands. The usual bane of such expeditions is hurry; because men seldom allot themselves half the time they should do: but, fixing on a day for their return, post from place to place, rather as if they were on a journey that required dispatch, than as philosophers investigating the works of nature. You must have made, no doubt, many discoveries, and laid up a good fund of materials for a future edition of the *British Zoology*; and will have no reason to repent that you have bestowed so much pains on a part of *Great-Britain* that perhaps was never so well examined before.

It has always been matter of wonder to me that fieldfares, which are so congenerous to thrushes and blackbirds, should never chuse to breed in *England*: but that they should not think even the high-

lands cold and northerly, and sequestered enough, is a circumstance still more strange and wonderful. The ring-ousel, you find, stays in *Scotland* the whole year round [1]; so that we have reason to conclude that those migrators that visit us for a short space every autumn do not come from thence.

And here, I think, will be the proper place to mention that those birds were most punctual again in their migration this autumn, appearing, as before, about the 30th of *September*: but their flocks were larger than common, and their stay protracted somewhat beyond the usual time. If they came to spend the whole winter with us, as some of their congeners do, and then left us, as they do, in spring, I should not be so much struck with the occurrence, since it would be similar to that of the other winter birds of passage; but when I see them for a fortnight at *Michaelmas*, and again for about a week in the middle of *April*, I am seized with wonder, and long to be informed whence these travellers come, and whither they go, since they seem to use our hills merely as an inn or baiting place.[2]

Your account of the greater brambling, or snow-fleck,[3] is very amusing; and strange it is that such a short-winged bird should delight in such perilous voyages over the northern ocean! Some country people in the winter time have every now and then told me that they have seen two or three white larks on our downs; but, on considering the matter, I begin to suspect that these are some stragglers of the birds we are talking of, which sometimes perhaps may rove so far to the southward.

It pleases me to find that white hares [4] are so frequent on the *Scottish* mountains, and especially as you inform me that it is a distinct species; for the quadrupeds of *Britain* are so few, that every new species is a great acquisition.

The eagle-owl,[5] could it be proved to belong to us, is so majestic a bird, that it would grace our *fauna* much. I never was informed before where wild-geese are known to breed.[6]

You admit, I find, that I have proved your *fen salicaria* to be the lesser reed-sparrow of *Ray*: and I think that you may be secure

that I am right; for I took very particular pains to clear up that matter, and had some fair specimens; but, as they were not well preserved, they are decayed already. You will, no doubt, insert it in it's proper place in your next edition. Your additional plates will much improve your work.

De Buffon, I know, has described the water shrew-mouse [7]: but still I am pleased to find you have discovered it in *Lincolnshire*, for the reason I have given in the article on the white hare.

As a neighbour was lately plowing in a dry chalky field, far removed from any water, he turned out a water-rat, that was curiously laid up in an *hybernaculum* artificially formed of grass and leaves. At one end of the *burrow* lay above a gallon of potatoes regularly stowed, on which it was to have supported itself for the winter. But the difficulty with me is how this *amphibius mus* came to fix it's winter station [8] at such a distance from the water. Was it determined in it's choice of that place by the mere accident of finding the potatoes which were planted there; or is it the constant practice of the aquatic-rat to forsake the neighbourhood of the water in the colder months?

Though I delight very little in analogous reasoning, knowing how fallacious it is with respect to natural history; yet, in the following instance, I cannot help being inclined to think it may conduce towards the explanation of a difficulty that I have mentioned before, with respect to the invariable early retreat of the *hirundo apus*, or swift, so many weeks before its congeners; and that not only with us, but also in *Andalusia*, where they also begin to retire about the beginning of *August*.

The great large bat * (which by the by is at present a non-descript in *England*, and what I have never been able yet to procure) retires or migrates very early in the summer: it also ranges very high for it's food, feeding in a different region of the air; and that is the

* The little bat appears almost every month in the year; but I have never seen the large ones till the end of *April*, nor after *July*. They are most common in *June*, but never in any plenty: are a rare species with us.[9]

reason I never could procure one. Now this is exactly the case with the swifts; for they take their food in a more exalted region than the other species, and are very seldom seen hawking for flies near the ground, or over the surface of the water. From hence I would conclude that these *hirundines*, and the larger bats, are supported by some sorts of high-flying gnats, scarabs, or *phalænæ*, that are of short continuance; and that the short stay of these strangers is regulated by the defect of their food.

By my journal it appears that curlews [10] clamoured on to *October* the thirty-first; since which I have not seen or heard any. Swallows were observed on to *November* the third.

[1] This, like Pennant's previous assurance, is ill-founded; as he only crossed the Border on 17th July and was back at Carlisle on the way home by 20th September he must have had the information at second-hand.

[2] For wayside refreshment.

[3] The snow bunting.

[4] The mountain or blue hare, *Lepus timidus* (L.).

[5] The eagle-owl owes its place on the British list to a few accidental occurrences. It has never bred.

[6] Grey lag-geese bred in Cambridgeshire up till four years after this, and in Lincolnshire for a generation after Pennant's visit; now they breed with us only in north Scotland and the Outer Hebrides.

[7] Later observation has shown the water-shrew to be widely distributed in suitable places, Selborne amongst them.

[8] This curious observation, recorded on hearsay, is unconfirmed, and is almost certainly a mistake.

[9] The "little bat" is evidently the Pipistrelle and the large one the Noctule, which feeds for less than an hour about dusk and again about dawn, regularly until late September.

[10] Stone-curlews.

LETTER XXVII

TO THE SAME

Selborne, *Feb.* 22, 1770.

DEAR SIR,

HEDGE-HOGS abound in my gardens and fields. The manner in which they eat their roots of the plantain in my grass-walks is very

curious: with their upper mandible, which is much longer than their lower, they bore under the plant, and so eat the root off upwards, leaving the tuft of leaves untouched. In this respect they are serviceable, as they destroy a very troublesome weed; but they deface the walks in some measure by digging little round holes. It appears, by the dung that they drop upon the turf, that beetles are no inconsiderable part of their food. In *June* last I procured a litter of four or five young hedge-hogs, which appeared to be about five or six days old; they, I find, like puppies, are born blind, and could not see when they came to my hands. No doubt their spines are soft and flexible at the time of their birth, or else the poor dam would have but a bad time of it in the critical moment of parturition: but it is plain that they soon harden; for these little pigs had such stiff prickles on their backs and sides as would easily have fetched blood, had they not been handled with caution. Their spines are quite white at this age; and they have little hanging ears, which I do not remember to be discernible in the old ones. They can, in part, at this age draw their skin down over their faces; but are not able to contract themselves into a ball, as they do, for the sake of defence, when full grown. The reason, I suppose, is, because the curious muscle that enables the creature to roll itself up in a ball was not then arrived at it's full tone and firmness. Hedge-hogs make a deep and warm *hybernaculum* with leaves and moss, in which they conceal themselves for the winter: but I never could find that they stored in any winter provision, as some quadrupeds certainly do.

I have discovered an anecdote with respect to the fieldfare (*turdus pilaris*), which I think is particular enough: this bird, though it sits on trees in the day-time, and procures the greatest part of it's food from white-thorn hedges; yea, moreover, builds on very high trees; as may be seen by the *fauna suecica*; yet always appears with us to roost on the ground. They are seen to come in flocks just before it is dark, and to settle and nestle among the heath on our forest. And besides, the larkers, in dragging their nets by

night, frequently catch them in the wheat-stubbles; while the bat-fowlers, who take many red-wings in the hedges, never entangle any of this species. Why these birds, in the matter of roosting, should differ from all their congeners, and from themselves also with respect to their proceedings by day, is a fact for which I am by no means able to account.

I have somewhat to inform you of concerning the *moose-deer*; but in general foreign animals fall seldom in my way: my little intelligence is confined to the narrow sphere of my own observations at home.

LETTER XXVIII

TO THE SAME

Selborne, *March*, 1770.

On *Michaelmas-day* 1768 I managed to get a sight of the female moose belonging to the duke of *Richmond*, at *Goodwood*; but was greatly disappointed, when I arrived at the spot, to find that it died, after having appeared in a languishing way for some time, on the morning before. However, understanding that it was not stripped, I proceeded to examine this rare quadruped: I found it in an old green-house, slung under the belly and chin by ropes, and in a standing posture; but, though it had been dead for so short a time, it was in so putrid a state that the stench was hardly supportable. The grand distinction between this deer, and any other species that I have ever met with, consisted in the strange length of it's legs; on which it was tilted up much in the manner of the birds of the *grallæ* order. I measured it, as they do an horse, and found that, from the ground to the wither, it was just five feet four inches; which height answers exactly to sixteen hands, a growth that few horses arrive at: but then, with this length of legs, it's neck was remarkably short, no more than twelve inches; so that, by straddling with one foot

forward and the other backward, it grazed on the plain ground, with the greatest difficulty, between it's legs: the ears were vast and lopping, and as long as the neck; the head was about twenty inches long, and ass-like; and had such a redundancy of upper lip as I never saw before, with huge nostrils. This lip, travellers say, is esteemed a dainty dish in *North America*. It is very reasonable to suppose that this creature supports itself chiefly by browsing of trees, and by wading after water plants; towards which way of livelihood the length of legs and great lip must contribute much. I have read somewhere that it delights in eating the *nymphæa*, or water-lily. From the fore-feet to the belly behind the shoulder it measured three feet and eight inches: the length of the legs before and behind consisted a great deal in the *tibia*, which was strangely long; but, in my haste to get out of the stench, I forgot to measure that joint exactly. It's scut seemed to be about an inch long; the colour was a grizzly black; the mane about four inches long; the fore-hoofs were upright and shapely, the hind flat and splayed. The spring before it was only two years old, so that most probably it was not then come to it's growth. What a vast tall beast must a full grown stag be! I have been told some arrive at ten feet and an half! This poor creature had at first a female companion of the same species, which died the spring before. In the same garden was a young stag, or red deer, between whom and this moose it was hoped that there might have been a breed; but their inequality of height must have always been a bar to any commerce of the amorous kind. I should have been glad to have examined the teeth, tongue, lips, hoofs, etc., minutely; but the putrefaction precluded all further curiosity. This animal, the keeper told me, seemed to enjoy itself best in the extreme frost of the former winter. In the house they showed me the horn of a male moose, which had no front-antlers, but only a broad palm with some snags on the edge. The noble owner of the dead moose proposed to make a skeleton of her bones.

Please to let me hear if my female moose corresponds with that

you saw; and whether you think still that the *American* moose and *European* elk are the same creature.[1] I am,

With the greatest esteem, etc.

[1] The two are generally regarded now as one species.

LETTER XXIX

TO THE SAME

Selborne, *May* 12, 1770.

Dear Sir,

Last month we had such a series of cold turbulent weather, such a constant succession of frost, and snow, and hail, and tempest, that the regular migration or appearance of the summer birds was much interrupted. Some did not shew themselves (at least were not heard) till weeks after their usual time; as the *black-cap* and *white-throat*; and some have not been heard yet, as the *grasshopper-lark* and largest *willow-wren*. As to the *fly-catcher*, I have not seen it; it is indeed one of the latest, but should appear about this time: and yet, amidst all this meteorous strife and war of the elements, two swallows discovered themselves as long ago as the eleventh of *April*, in frost and snow; but they withdrew quickly, and were not visible again for many days. House-martins which are always more backward than swallows, were not observed till *May* came in.

Among the *monogamous* birds several are to be found, after pairing-time, single, and of each sex: but whether this state of celibacy[1] is matter of choice or necessity, is not so easily discoverable. When the house-sparrows deprive my martins of their nests, as soon as I cause one to be shot, the other, be it cock or hen, presently procures a mate, and so for several times following.

I have known a dove-house infested by a pair of white owls, which made great havock among the young pigeons: one of the owls was shot as soon as possible; but the survivor readily found

a mate, and the mischief went on. After some time the new pair were both destroyed, and the annoyance ceased.

Another instance I remember of a sportsman, whose zeal for the increase of his game being greater than his humanity, after pairing-time he always shot the cock-bird of every couple of partridges upon his grounds; supposing that the rivalry of many males interrupted the breed: he used to say, that, though he had widowed the same hen several times, yet he found she was still provided with a fresh paramour, that did not take her away from her usual haunt.

Again; I knew a lover of setting, an old sportsman, who has often told me that soon after harvest he has frequently taken small coveys of partridges, consisting of cock-birds alone; these he pleasantly used to call old bachelors.

There is a propensity belonging to common house-cats that is very remarkable; I mean their violent fondness for fish, which appears to be their most favourite food: and yet nature in this instance seems to have planted in them an appetite that, unassisted, they know not how to gratify: for of all quadrupeds cats are the least disposed towards water; and will not, when they can avoid it, deign to wet a foot, much less to plunge into that element.

Quadrupeds that prey on fish are amphibious: such is the otter, which by nature is so well formed for diving, that it makes great havock among the inhabitants of the waters. Not supposing that we had any of those beasts in our shallow brooks, I was much pleased to see a male otter brought to me, weighing twenty-one pounds, that had been shot on the bank of our stream below the *Priory*, where the rivulet divides the parish of *Selborne* from *Harteley-wood*.

[1] In order to breed, a bird must not only feel the impulse to do so, but must secure a suitable nesting-site and an assured food-supply for the young. These, particularly the second, are rigidly limited in number, and the supply generally falls far short of the demand, so that the surplus birds, forcibly excluded by those in possession, find themselves debarred from reproduction. Out of their ranks any vacancies among the more fortunate are immediately filled in the manner described. Even if the cock or hen is repeatedly shot the survivor will almost always find a mate without apparent difficulty, except in the case of more or less rare species.

LETTER XXX

TO THE SAME

Selborne, *Aug.* 1, 1770.

DEAR SIR,

THE *French*, I think, in general are strangely prolix in their natural history. What *Linnæus* says with respect to insects holds good in every other branch: "*Verbositas præsentis sæculi, calamitas artis*".

Pray how do you approve of *Scopoli's* new work? As I admire his *Entomologia*, I long to see it.

I forgot to mention in my last letter (and had not room to insert in the former) that the male moose, in rutting time, swims from island to island, in the lakes and rivers of *North-America*, in pursuit of the females. My friend, the chaplain, saw one killed in the water as it was on that errand in the river St. *Lawrence*: it was a monstrous beast, he told me; but he did not take the dimensions.

When I was last in town our friend Mr. *Barrington* most obligingly carried me to see many curious sights. As you were then writing to him about horns, he carried me to see many strange and wonderful specimens. There is, I remember, at Lord *Pembroke's*, at *Wilton*, an horn room furnished with more than thirty different pairs; but I have not seen that house lately.

Mr. *Barrington* shewed me many astonishing collections of stuffed and living birds from all quarters of the world. After I had studied over the latter for a time, I remarked that every species almost that came from distant regions, such as *South America*, the coast of *Guinea*, &c., were thick-billed birds of the *loxia* and *fringilla* genera; and no *motacillæ*, or *muscicapæ*, were to be met with. When I came to consider, the reason was obvious enough; for the hard-billed birds subsist on seeds which are easily carried on board; while the soft-billed birds, which are supported by worms and insects, or, what is a *succedaneum* for them, fresh raw meat, can meet with neither in

long and tedious voyages. It is from this defect of food that our collections (curious as they are) are defective, and we are deprived of some of the most delicate and lively genera.

I am, &c.

LETTER XXXI

TO THE SAME

Selborne, *Sept.* 14, 1770.

Dear Sir,

You saw, I find, the ring-ousels again among their native crags; and are farther assured that they continue resident in those cold regions the whole year. From whence then do our ring-ousels migrate so regularly every *September*, and make their appearance again, as if in their return, every *April*? They are more early this year than common, for some were seen at the usual hill on the fourth of this month.

An observing *Devonshire* gentleman [1] tells me that they frequent some parts of *Dartmoor*, and breed there; but leave those haunts about the end of *September* or beginning of *October*, and return again about the end of *March*.

Another intelligent person assures me that they breed in great abundance all over the *Peak* of *Derby*, and are called there *Torousels*; withdraw in *October* and *November*, and return in spring. This information seems to throw some light on my new migration.

Scopoli's * new work (which I have just procured) has it's merit in ascertaining many of the *Tirol* and *Carniola*. Monographers, come from whence they may, have, I think, fair pretence to challenge some regard and approbation from the lovers of natural history; for, as no man can alone investigate all the works of nature, these partial writers may, each in their department, be more accurate in their discoveries, and freer from errors, than more general writers;

* *Annus Primus Historico-Naturalis.*

and so by degrees may pave the way to an universal correct natural history. Not that *Scopoli* is so circumstantial and attentive to the life and conversation of his birds as I could wish: he advances some false facts; as when he says of the *hirundo urbica* that "*pullos extra "nidum non nutrit*". This assertion I know to be wrong from repeated observation this summer; for house-martins do feed their young flying, though it must be acknowledged not so commonly as the house-swallow; and the feat is done in so quick a manner as not to be perceptible to indifferent observers. He also advances some (I was going to say) improbable facts; as when he says of the woodcock that "*pullos rostro portat fugiens ab hoste*".[2] But candour forbids me to say absolutely that any fact is false, because I have never been witness to such a fact. I have only to remark that the long unwieldy bill of the woodcock is perhaps the worst adapted of any among the winged creation for such a feat of natural affection.

I am, &c.

[1] Probably Sampson Newbery, Fellow of Exeter College, Oxford, who supplied further information on the point in an extant letter dated 14th June 1774.

[2] "It carries its young in the bill when flying from an enemy." That it does carry them is beyond doubt, but evidence on the exact method, though abundant, is conflicting. Sometimes the dangling feet bear the burden alone; often it is held against the thighs and supported either by the feet or the bill, or both.

LETTER XXXII

TO THE SAME

Selborne, *October* 29, 1770.

Dear Sir,

After an ineffectual search in *Linnæus, Brisson,* &c., I begin to suspect that I discern my brother's *hirundo hyberna* in *Scopoli's* new discovered *hirundo rupestris,* p. 167. His description of "*Supra* [1] *murina, subtus "albida; rectrices maculâ ovali albâ in latere interno; pedes nudi, "nigri; rostrum nigrum; remiges obscuriores quam plumæ dorsales; "rectrices remigibus concolores; caudâ emarginatâ, nec forcipatâ;*"

agrees very well with the bird in question: but when he comes to advance that it is "*statura hirundinis urbicæ,*" and that "*definitio "hirundinis ripariæ Linnæi huic quoque convenit,*" he in some measure invalidates all he has said; at least he shews at once that he compares them to these species merely from memory: for I have compared the birds themselves, and find they differ widely in every circumstance of shape, size, and colour. However, as you will have a specimen, I shall be glad to hear what your judgment is in the matter.

Whether my brother is forestalled in his non-descript or not, he will have the credit of first discovering that they spend their winters under the warm and sheltery shores of *Gibraltar* and *Barbary*.

Scopoli's characters of his ordines and genera are clean, just, and expressive, and much in the spirit of *Linnæus*. These few remarks are the result of my first perusal of *Scopoli's Annus Primus*.

The bane of our science is the comparing one animal to the other by memory: for want of caution in this particular *Scopoli* falls into errors: he is not so full with regard to the manners of his indigenous birds as might be wished, as you justly observe: his Latin is easy, elegant, and expressive, and very superior to *Kramer's*.*

I am pleased to see that my description of the *moose* corresponds so well with yours.

I am, &c.

[1] "Mouse-colour above, whiteish below; tail-feathers with an oval white spot on the inner margin; feet unfeathered, black; bill black; primaries darker than the mantle; tail-feathers the same colour as the primaries; tail emarginate and not forked . . . the size of a house-martin . . . Linnæus' definition of a sand-martin applies to this also."

The species described in the Latin extracts here translated is the non-British crag-martin, *Riparia rupestris* (Scopoli), which does not range nearly so far north or south as the sand-martin, performing lesser migrations or none at all. John White, Chaplain at Gibraltar and younger brother of the author, sent home specimens of this form during the summer of 1770.

* See his *Elenchus vegetabilium et animalium per Austriam inferiorem, &c.*

LETTER XXXIII

TO THE SAME

Selborne, *Nov.* 26, 1770.

DEAR SIR,

I WAS much pleased to see, among the collection of birds from *Gibraltar*, some of those short-winged *English* summer-birds of passage, concerning whose departure we have made so much inquiry. Now if these birds are found in *Andalusia* to migrate to and from *Barbary*, it may easily be supposed that those that come to us may migrate back to the continent, and spend their winters in some of the warmer parts of *Europe*.[1] This is certain, that many soft-billed birds that come to *Gibraltar* appear there only in spring and autumn, seeming to advance in pairs towards the northward, for the sake of breeding during the summer months; and retiring in parties and broods toward the south at the decline of the year: so that the rock of *Gibraltar* is the great rendezvous, and place of observation, from whence they take their departure each way towards *Europe or Africa*. It is therefore no mean discovery, I think, to find that our small short-winged summer birds of passage are to be seen spring and autumn on the very skirts of *Europe*; it is a presumptive proof of their emigrations.

Scopoli seems to me to have found the *hirundo melba*, the great *Gibraltar* swift,[2] in *Tirol*, without knowing it. For what is his *hirundo alpina* but the afore-mentioned bird in other words? Says he "*Omnia prioris*" (meaning the swift) "*sed pectus album; paulo* "*major priore*". I do not suppose this to be a new species. It is true also of the *melba* that "*nidificat in excelsis Alpium rupibus*". *Vid. Annum Primum.*

My *Sussex* friend, a man of observation and good sense, but no naturalist, to whom I applied on account of the *stone-curlew, oedicnemus*, sends me the following account: "In looking over my Naturalist's "Journal for the month of *April*, I find the *stone-curlews* are first "mentioned on the seventeenth and eighteenth, which date seems to

" me rather late. They live with us all the spring and summer, and " at the beginning of autumn prepare to take leave by getting together " in flocks. They seem to me a bird of passage that may travel into " some dry hilly country south of us, probably Spain, because of " the abundance of sheep-walks in that country; for they spend " their summers with us in such districts. This conjecture I hazard, " as I have never met with any one that has seen them in *England* " in the winter.[3] I believe they are not fond of going near the water, " but feed on earth-worms, that are common on sheep-walks and downs. " They breed on fallows and lay-fields abounding with mossy flints, " which resemble their young in colour; among which they skulk " and conceal themselves. They make no nest, but lay their eggs " on the bare ground, producing in common but two at a time. " There is reason to think their young run soon after they are hatched; " and that the old ones do not feed them, but only lead them about " at the time of feeding, which, for the most part, is in the night." Thus far my friend.

In the manners of this bird you see there is something very analogous to the bustard, whom it also somewhat resembles in aspect and make, and in the structure of it's feet.

For a long time I have desired my relation[4] to look out for these birds in *Andalusia*; and now he writes me word that, for the first time, he saw one dead in the market on the 3rd of *September*.

When the *oedicnemus* flies it stretches out it's legs straight behind, like an heron.

I am, &c.

[1] Very few of the British migrants in this class, including warblers and the like, remain in any part of Europe, the vast majority wintering in Africa.

[2] The Alpine swift, *Micropus melba melba* (L.), an occasional visitor to the British Isles. The Latin description runs: " All like the former, but the breast white; a trifle larger than the preceding. . . . It nests on lofty Alpine crags."

[3] They sometimes winter, especially in the south-west.

[4] John White, the author's brother.

LETTER XXXIV

TO THE SAME

Selborne, *March* 30, 1771.

DEAR SIR,

THERE is an insect with us, especially on chalky districts, which is very troublesome and teasing all the latter end of the summer, getting into people's skins, especially those of women and children, and raising tumours which itch intolerably. This animal (which we call an harvest bug [1]) is very minute, scarce discernible to the naked eye; of a bright scarlet colour, and of the genus of *Acarus*. They are to be met with in gardens on kidney-beans, or any legumens; but prevail only in the hot months of summer. Warreners, as some have assured me, are much infested by them on chalky downs; where these insects swarm sometimes to so infinite a degree as to discolour their nets, and to give them a reddish cast, while the men are so bitten as to be thrown into fevers.

There is a small long shining fly [2] in these parts very troublesome to the housewife, by getting into the chimnies, and laying it's eggs in the bacon while it is drying: these eggs produce maggots called *jumpers*, which, harbouring in the gammons and best parts of the hogs, eat down to the bone, and make great waste. This fly I suspect to be a variety of the *musca putris* of *Linnæus*: it is to be seen in the summer in farm-kitchens on the bacon-racks and about the mantel-pieces, and on the ceilings.

The insect that infests turnips and many crops in the garden (destroying often whole fields while in their seedling leaves) is an animal that wants to be better known. The country people here call it the *turnip-fly* and *black-dolphin* [3]; but I know it to be one of the *coleoptera*; the "*chrysomela oleracea, saltatoria, femoribus posticis "crassissimis"*. In very hot summers they abound to an amazing degree, and, as you walk in a field or in a garden, make a pattering like rain, by jumping on the leaves of the turnips or cabbages.

There is an *Oestrus*,[4] known in these parts to every ploughboy;

which, because it is omitted by *Linnæus*, is also passed over by late writers, and that is the *curvicauda* of old *Moufet*, mentioned by *Derham* in his Physico-theology, p. 250 : an insect worthy of remark for depositing it's eggs as it flies in so dexterous a manner on the single hairs of the legs and flanks of grass-horses. But then *Derham* is mistaken when he advances that this *Oestrus* is the parent of that wonderful star-tailed maggot which he mentions afterwards ; for more modern entomologists have discovered that singular production to be derived from the egg of the *musca chamæleon* [5] : see *Geoffroy*,[6] t. 17, f. 4.

A full history of noxious insects hurtful in the field, garden, and house, suggesting all the known and likely means of destroying them, would be allowed by the public to be a most useful and important work. What knowledge there is of this sort lies scattered, and wants to be collected ; great improvements would soon follow of course. A knowledge of the properties, œconomy, propagation, and in short of the life and conversation of these animals, is a necessary step to lead us to some method of preventing their depredations.

As far as I am a judge, nothing would recommend entomology more than some neat plates that should well express the *generic distinctions* of insects according to *Linnæus* ; for I am well assured that many people would study insects, could they set out with a more adequate notion of those distinctions than can be conveyed at first by words alone.

[1] Not an insect, but the young of several species of the mite *Trombicula*.

[2] *Piophila casei* (L.).

[3] Actually a beetle, *Phyllotreta nemorum* (L.).

[4] The horse bot-fly or horse gad-fly *Gasterophilus intestinalis* (De G.) (*equi* auctorum). Linnæus includes it both in the *Systema* and in *Fauna Suecica*. The eggs are always deposited on some part of the horse within reach of its mouth ; after hatching they set up an irritation, are licked and swallowed, spend about a year attached to the walls of the stomach, and then proceed by the intestines to the ground. Dr. Thomas Moffett, Moufet, or Muffet, an eminent Elizabethan, wrote a *Theatre of Insects* in addition to his more celebrated *Health's Improvement*. He was physician to many famous people, and received his specimens of the flying fish from Sir Francis Drake.

[5] Now *Stratiomys chamaeleon* (Linn.).

[6] Stephen Francis Geoffroy (1672–1731), a physician, botanist, and chemist who spent much of his life in England, though he began and ended it at Paris.

LETTER XXXV

TO THE SAME

Selborne, 1771.

DEAR SIR,

HAPPENING to make a visit to my neighbour's peacocks, I could not help observing that the trains of those magnificent birds appear by no means to be their tails; those long feathers growing not from their *uropygium*, but all up their backs. A range of short brown stiff feathers, about six inches long, fixed in the *uropygium*, is the real tail, and serves as the *fulcrum* to prop the train, which is long and top-heavy, when set on end. When the train is up, nothing appears of the bird before but it's head and neck; but this would not be the case were those long feathers fixed only in the rump, as may be seen by the turkey-cock when in a strutting attitude. By a strong muscular vibration these birds can make the shafts of their long feathers clatter like the swords of a sword-dancer; they then trample very quick with their feet, and run backwards towards the females.

I should tell you that I have got an uncommon *calculus ægogropila*, taken out of the stomach of a fat ox; it is perfectly round, and about the size of a large *Seville* orange; such are, I think, usually flat.

LETTER XXXVI

TO THE SAME

Sept. 1771.

DEAR SIR,

THE summer through I have seen but two of that large species of bat [1] which I call *vespertilio altivolans*, from it's manner of feeding high in the air: I procured one of them, and found it to be a male; and made no doubt, as they accompanied together, that the other was a female: but, happening in an evening or two to procure the other likewise, I was somewhat disappointed, when it appeared to

be also of the same sex. This circumstance, and the great scarcity of this sort, at least in these parts, occasions some suspicions in my mind whether it is really a species, or whether it may not be the male part of the more known species, one of which may supply many females; as is known to be the case in sheep, and some other quadrupeds. But this doubt can only be cleared by a farther examination, and some attention to the sex, of more specimens: all that I know at present is, that my two were amply furnished with the parts of generation much resembling those of a boar.

In the extent of their wings they measured fourteen inches and an half; and four inches and an half from the nose to the tip of the tail: their heads were large, their nostrils bilobated, their shoulders broad and muscular; and their whole bodies fleshy and plump. Nothing could be more sleek and soft than their fur, which was of a bright chestnut colour; their maws were full of food, but so macerated that the quality could not be distinguished; their livers, kidnies, and hearts, were large, and their bowels covered with fat. They weighed each, when entire, full one ounce and one drachm. Within the ear there was somewhat of a peculiar structure [2] that I did not understand perfectly; but refer it to the observation of the curious anatomist. These creatures sent forth a very rancid and offensive smell.

[1] The Noctule. Sometimes, though not invariably, the sexes are found more or less segregated; out of nineteen found in a hollow tree, sixteen proved to be males.

[2] The tragus.

LETTER XXXVII

TO THE SAME

Selborne, 1771.

Dear Sir,

On the twelfth of *July* I had a fair opportunity of contemplating the motions of the *caprimulgus*, or fern-owl, as it was playing round a large oak that swarmed with *scarabæi solstitiales*,[1] or fern-chafers.

The powers of it's wing were wonderful, exceeding, if possible, the various evolutions and quick turns of the swallow genus. But the circumstance that pleased me most was, that I saw it distinctly, more than once, put out it's short leg while on the wing, and, by a bend of the head, deliver somewhat into its mouth. If it takes any part of its prey with its foot, as I have now the greatest reason to suppose it does these chafers, I no longer wonder at the use of it's middle toe, which is curiously furnished with a serrated claw.

Swallows and martins, the bulk of them I mean, have forsaken us sooner this year than usual; for, on *September* the twenty-second, they rendezvoused in a neighbour's walnut-tree, where it seemed probable they had taken up their lodging for the night. At the dawn of the day, which was foggy, they arose all together in infinite numbers, occasioning such a rushing from the strokes of their wings against the hazy air, as might be heard to a considerable distance: since that no flock has appeared, only a few stragglers.

Some swifts staid late, till the twenty-second of *August*—a rare instance! for they usually withdraw within the first week.[2] *

On *September* the twenty-fourth three or four ring-ousels appeared in my fields for the first time this season: how punctual are these visitors in their autumnal and spring migrations!

[1] Now *Rhizotragus solstitialis*, a small species of cockchafer.

[2] At the present day swifts generally remain in some numbers until the third week of August, but during September only a few stragglers are noticed.

LETTER XXXVIII

TO THE SAME

Selborne, *March* 15, 1773.

Dear Sir,

By my journal for last autumn it appears that the house-martins bred very late, and staid very late in these parts; for, on the first of

* See letter lii. to Mr. Barrington.

October, I saw young martins in their nests nearly fledged; and again, on the twenty-first of *October*, we had at the next house a nest full of young martins just ready to fly; and the old ones were hawking for insects with great alertness. The next morning the brood forsook their nest, and were flying round the village. From this day I never saw one of the swallow kind till *November* the third; when twenty, or perhaps thirty, house-martins were playing all day long by the side of the hanging wood, and over my fields. Did these small weak birds, some of which were nestlings twelve days ago, shift their quarters at this late season of the year to the other side of the northern tropic? Or rather, is it not more probable that the next church, ruin, chalk-cliff, steep covert, or perhaps sand-bank, lake or pool (as a more northern naturalist would say), may become their *hybernaculum*, and afford them a ready and obvious retreat?

We now begin to expect our vernal migration of ring-ousels every week. Persons worthy of credit [1] assure me that ring-ousels were seen at *Christmas* 1770 in the forest of *Bere*, on the southern verge of this county. Hence we may conclude that their migrations are only internal, and not extended to the continent southward, if they do at first come at all from the northern parts of this island only, and not from the north of *Europe*. Come from whence they will, it is plain, from the fearless disregard that they shew for men or guns, that they have been little accustomed to places of much resort. Navigators mention that in the *Isle of Ascension*, and other such desolate districts, birds are so little acquainted with the human form that they settle on men's shoulders; and have no more dread of a sailor than they would have of a goat that was grazing. A young man at *Lewes*, in *Sussex*, assured me that about seven years ago ring-ousels abounded so about that town in the autumn that he killed sixteen himself in one afternoon: he added further, that some had appeared since in every autumn; but he could not find that any had been observed before the season in which he shot so many. I myself have found these birds in little parties in the autumn cantoned

all along the *Sussex* downs, wherever there were shrubs and bushes, from *Chichester* to *Lewes*; particularly in the autumn of 1770.

I am, &c.

[1] They were probably wrong, though wintering ring-ousels are reported from time to time.

LETTER XXXIX

TO THE SAME

Selborne, *Nov.* 9, 1773.

DEAR SIR,

As you desire me to send you such observations as may occur, I take the liberty of making the following remarks, that you may, according as you think me right or wrong, admit or reject what I here advance, in your intended new edition [1] of the *British Zoology*.

The osprey was shot about a year ago at *Frinsham-pond*, a great lake, at about six miles from hence, while it was sitting on the handle of a plough and devouring a fish: it used to precipitate itself into the water, and so take it's prey by surprise.

A great ash-coloured butcher-bird [2] was shot last winter in *Tisted-park*, and a red-backed butcher-bird [3] at *Selborne*: they are *raræ aves* in this country.

Crows go in pairs the whole year round.

Cornish choughs abound, and breed on *Beachy-head* and on all the cliffs of the *Sussex* coast.

The common wild-pigeon, or stock-dove, is a bird of passage [4] in the south of England, seldom appearing till towards the end of *November*; is usually the latest winter-bird of passage. Before our beechen woods were so much destroyed we had myriads of them, reaching in strings for a mile together as they went out in a morning to feed. They leave us early in spring; where do they breed?

The people of *Hampshire* and *Sussex* call the missel-bird the storm-cock, because it sings early in the spring in blowing showery

weather; it's song often commences with the year: with us it builds much in orchards.

A gentleman assures me he has taken the nests of ring-ousels on *Dartmoor*: they build in banks on the sides of streams.

Titlarks [5] not only sing sweetly as they sit on trees, but also as they play and toy about on the wing; and particularly while they are descending, and sometimes as they stand on the ground.

Adanson's testimony seems to me to be a very poor evidence that *European* swallows migrate during our winter to *Senegal*: he does not talk at all like an ornithologist; and probably saw only the swallows of that country,[6] which I know build within Governor *O'Hara's* hall against the roof. Had he known *European* swallows, would he not have mentioned the species?

The *house-swallow* washes by dropping into the water as it flies: this species appears commonly about a week before the *house-martin*, and about ten or twelve days before the *swift*.

In 1772 there were young house-martins in their nest till *October* the twenty-third.

The *swift* appears about *ten* or *twelve* days later than the *house-swallow*: *viz.* about the twenty-fourth or twenty-sixth of *April*.

Whin-chats and *stone-chatters* stay with us the whole year.[7]

Some wheat-ears continue with us the winter through.

Wagtails, all sorts, remain with us all the winter.

Bulfinches, when fed on hempseed, often become wholly black.

We have vast flocks of *female* chaffinches all the winter, with hardly any males among them.

When you say that in breeding-time the cock-snipes make a bleating noise, and I a drumming (perhaps I should have rather said an humming), I suspect we mean the same thing. However, while they are playing about on the wing they certainly make a loud piping with their mouths: but whether that bleating or humming is ventriloquous, or proceeds from the motion of their wings,[8] I cannot say; but this I know, that when this noise happens the bird is always descending, and his wings are violently agitated.

Soon after the lapwings have done breeding they congregate, and, leaving the moors and marshes, betake themselves to downs and sheep-walks.

Two years ago last spring the little auk was found alive and unhurt, but fluttering and unable to rise, in a lane a few miles from *Alresford*, where there is a great lake: it was kept awhile, but died.

I saw young teals taken alive in the ponds of *Wolmer-forest* in the beginning of *July*[9] last, along with flappers, or young wild ducks.

Speaking of the *swift*, that page says "*it's drink the dew*"; whereas it should be "it drinks on the wing"; for all the swallow kind sip their water as they sweep over the face of pools or rivers: like *Virgil's* bees, they drink flying, "*flumina summa libant*". In this method of drinking perhaps this genus may be peculiar.

Of the sedge-bird be pleased to say it sings most part of the night; it's notes are hurrying, but not unpleasing, and imitative of several birds; as the sparrow, swallow, sky-lark. When it happens to be silent in the night, by throwing a stone or clod into the bushes where it sits you immediately set it a singing; or in other words, though it slumbers sometimes, yet as soon as it is awakened it resumes it's song.

[1] The 3rd, published in 1776. Almost all this information was used by Pennant, and the footnotes to the 1st Edition of *Selborne* contain a complete set of page references. Since the *British Zoology* has long ceased to be a work of reference, these are now left out.

[2] The great grey shrike is a winter migrant in small numbers, chiefly to the eastern counties.

[3] The red-backed shrike is a fairly common summer visitor to south and central Britain: it never winters.

[4] The stock-dove, which has recently been steadily extending its breeding range in this country, is now a resident species in the south, and in almost all parts.

[5] The tree-pipit, *Anthus trivialis trivialis*, and the meadow-pipit, *A. pratensis pratensis*, were not generally distinguished in England until some years later. Pennant in 1768 describes a "lesser field lark" with the true criterion of a short hind claw, but he also includes two imaginary species and the difference in life-history is clearly unknown to him. The 3rd edition of the *Encyclopœdia Britannica* as late as 1797 gives the tree-pipit only as "a native of Sweden", where Linnæus had

already described it. Montagu appears to be the first English writer to distinguish satisfactorily between the two. This passage refers chiefly, if not exclusively, to the tree-pipit, a summer migrant to this country.

[6] *Hirundo lucida*. Adanson's observations undoubtedly referred to our own species, as he explicitly notes "that these birds were taken and that he knew them to be European swallows". In December 1922 a swallow ringed at Cardiff was recovered at the mouth of the Congo.

[7] The whinchat, wheatear, and yellow wagtail are at present summer visitors to the British Isles; the stonechat, grey wagtail and pied wagtail residents. For the question of wintering see p. 64.

[8] The drumming of snipe is caused by the vibration of short feathers standing out stiffly at an angle to the tail in descent.

[9] In a letter to John White, dated from Selborne on June 26th, 1773, these young teal are already mentioned as having lately been taken, so the date here given is too late; it should be about midsummer.

LETTER XL

TO THE SAME

Selborne, *Sept.* 2, 1774.

Dear Sir,

Before your letter arrived, and of my own accord, I had been remarking and comparing the tails of the male and female swallow, and this ere any young broods appeared; so that there was no danger of confounding the dams with their *pulli*: and besides, as they were then always in pairs, and busied in the employ of nidification, there could be no room for mistaking the sexes, nor the individuals of different chimnies the one for the other. From all my observations, it constantly appeared that each sex has the long feathers in it's tail that give it that forked shape; with this difference, that they are longer in the tail of the male than in that of the female.

Nightingales, when their young first come abroad, and are helpless, make a plaintive and a jarring noise; and also a snapping or cracking, pursuing people along the hedges as they walk: these last sounds seem intended for menace and defiance.

The grasshopper-lark chirps all night in the height of summer.

Swans turn white the second year, and breed the third.

Weasels prey on moles, as appears by their being sometimes caught in mole-traps.

Sparrow-hawks sometimes breed in old crows' nests, and the kestril in churches and ruins.

There are supposed to be two sorts of eels in the island of *Ely*. The threads sometimes discovered in eels are perhaps their young: the generation of eels is very dark and mysterious.[1]

Hen-harriers breed on the ground, and seem never to settle on trees.

When redstarts shake their tails they move them horizontally, as dogs do when they fawn: the tail of a wagtail, when in motion, bobs up and down like that of a jaded horse.

Hedge-sparrows have a remarkable flirt with their wings in breeding-time; as soon as frosty mornings come they make a very piping plaintive noise.

Many birds which become silent about *Midsummer* reassume their notes again in *September*; as the thrush, blackbird, wood-lark, willow-wren, &c.; hence *August* is by much the most mute month, the spring, summer and autumn through. Are birds induced to sing again because the temperament of autumn resembles that of spring?

Linnæus ranges plants geographically; palms inhabit the tropics, grasses the temperate zones, and mosses and lichens the polar circles; no doubt animals may be classed in the same manner with propriety.

House-sparrows build under eaves in the spring; as the weather becomes hotter they get out for coolness, and nest in plum-trees and apple-trees. These birds have been known sometimes to build in rooks' nests, and sometimes in the forks of boughs under rooks' nests.

As my neighbour was housing a rick he observed that his dogs devoured all the little red mice [2] that they could catch, but rejected the common mice; and that his cats ate the common mice, refusing the red.

Red-breasts sing all through the spring, summer, and autumn. The reason that they are called autumn songsters is, because in the two first seasons their voices are drowned and lost in the general chorus; in the latter their song becomes distinguishable. Many songsters of the autumn seem to be the young cock red-breasts of that year; notwithstanding the prejudices in their favour, they do much mischief [3] in gardens to the summer-fruits.*

The titmouse, which early in *February* begins to make two quaint notes, like the whetting of a saw, is the marsh titmouse [4]: the great titmouse sings with three cheerful joyous notes, and begins about the same time.

Wrens sing all the winter through, frost excepted.

House-martins came remarkably late this year both in *Hampshire* and *Devonshire*: is this circumstance for or against either hiding or migration?

Most birds drink sipping at intervals; but pigeons take a long continued draught, like quadrupeds.

Notwithstanding what I have said in a former letter, no grey crows were ever known to breed on *Dartmoor*; it was my mistake.

The appearance and flying of the *scarabæus solstitialis*, or fern-chafer, commence with the month of *July*, and cease about the end of it. These scarabs are the constant food of *caprimulgi*, or fern-owls, through that period. They abound on the chalky downs and in some sandy districts, but not in the clays.

In the garden of the *Black-bear* inn in the town of *Reading* is a stream or canal running under the stables and out into the fields on the other side of the road: in this water are many carps, which lie rolling about in sight, being fed by travellers, who amuse themselves by tossing them bread: but as soon as the weather grows at all severe these fishes are no longer seen, because they retire under the stables, where they remain till the return of spring. Do they lie in a torpid state? if they do not, how are they supported?

* They eat also the berries of the ivy, the honey-suckle, and the *euonymus europæus*, or spindle-tree.

The note of the white-throat, which is continually repeated, and often attended with odd gesticulations on the wing, is harsh and displeasing. These birds seem of a pugnacious disposition; for they sing with an erected crest and attitudes of rivalry and defiance; are shy and wild in breeding-time, avoiding neighbourhoods, and haunting lonely lanes and commons; nay even the very tops of the *Sussex-downs*, where there are bushes and covert; but in *July* and *August* they bring their broods into gardens and orchards, and make great havock among the summer-fruits.

The black-cap has in common a full, sweet, deep, loud, and wild pipe; yet that strain is of short continuance, and his motions are desultory; but when that bird sits calmly and engages in song in earnest, he pours forth very sweet, but inward melody, and expresses great variety of soft and gentle modulations, superior perhaps to those of any of our warblers, the nightingale excepted.

Black-caps mostly haunt orchards and gardens; while they warble their throats are wonderfully distended.

The song of the redstart is superior, though somewhat like that of the white-throat: some birds have a few more notes than others. Sitting very placidly on the top of a tall tree in a village, the cock sings from morning to night: he affects neighbourhoods, and avoids solitude, and loves to build in orchards and about houses; with us he perches on the vane of a tall maypole.

The fly-catcher is of all our summer birds the most mute and the most familiar; it also appears the last of any. It builds in a vine, or a sweetbriar, against the wall of an house, or in the hole of a wall, or on the end of a beam or plate, and often close to the post of a door where people are going in and out all day long. This bird does not make the least pretension to song, but uses a little inward wailing note when it thinks it's young in danger from cats or other annoyances: it breeds but once, and retires early.

Selborne parish alone can and has exhibited at times more than half the birds that are ever seen in all *Sweden*; the former has produced more than one hundred and twenty species, the latter only

two hundred and twenty-one. Let me add also that it has shown near half the species that were ever known in *Great-Britain*.* [5]

On a retrospect, I observe that my long letter carries with it a quaint and magisterial air, and is very sententious; but, when I recollect that you requested stricture and anecdote, I hope you will pardon the didactic manner for the sake of the information it may happen to contain.

[1] We have only one species (the common eel, *Anguilla vulgaris*) which occurs in fresh water. The "threads" are intestinal worms. The spawning of the eel remained very dark and mysterious till the beginning of the twentieth century, when Schmidt and other investigators threw light on it. Between August and November the larger eels assume the breeding dress. In this stage they are called Silver Eels, and it is doubtful if they feed any more. They descend the rivers to the sea and migrate west, moving nearly ten miles a day towards their only known breeding quarters, which lie three thousand miles away between 22° and 30° N. lat. and beyond 40° W. long., in the Sargasso Sea. Here they spawn in early spring onwards, and here, it seems, they die, for no adult eel has ever been known to return to European waters. The larvae, floating below 100 fathoms in a temperature of about 68° Fahr., grow very fast till they become an inch long, drifting westward. Mingled with them are larvae of the American eel, whose breeding ground overlaps, but about the latitude of Bermuda the two streams separate, and those of the American species, developing three times as fast, turn into elvers at the age of about a year and enter the rivers. The European stream swings in the opposite direction and the transparent larvae, called *leptocephali*, developing very slowly, do not reach the British coast and turn into elvers until their third year. The first *leptocephalus* was taken off Holyhead eleven years before this letter was written, but it was not suspected for more than a century that these were the young of the eel.

[2] Harvest-mice.

[3] Although robins will undoubtedly eat soft fruits it is exceedingly rare for them to inflict any appreciable damage.

[4] This, like almost all references to the marsh-tit of earlier date than 1900, is extremely difficult to determine. It may refer either to the marsh-tit, *Parus palustris dresseri* (Stejn.), or to the recently separated willow-tit, *P. atricapillus kleinschmidti* (Hellm.)—a confusingly similar bird which entirely replaces it in Scotland, and, though local in England, appears to be the commoner about Selborne at the present time. Its characteristic shrill nasal *Ease-aig* or *Tchay* note may well be the one here intended, in which case this would probably be the earliest reference to the species, which Macgillivray observed without recognising in Scotland two generations later.

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* *Sweden*, 221, *Great-Britain*, 252 species.

Saw-sharpening is a likeness more often connected with the great tit than with either of these forms, and the passage would be more intelligible if the two names were transposed.

[5] The present British list includes 499 forms, belonging to 420 different species. Of these at least 230 are merely occasional or irregular visitors.

LETTER XLI

TO THE SAME

It is matter of curious inquiry to trace out how those species of soft-billed birds, that continue with us the winter through, subsist during the dead months. The imbecility of birds seems not to be the only reason why they shun the rigour of our winters; for the robust *wry-neck* (so much resembling the hardy race of *wood-peckers*) migrates, while the feeble little *golden-crowned wren*, that shadow of a bird, braves our severest frosts without availing himself of houses or villages, to which most of our winter birds crowd in distressful seasons, while this keeps aloof in fields and woods; but perhaps this may be the reason why they may often perish, and why they are almost as rare as any bird we know.

I have no reason to doubt but that the soft-billed birds, which winter with us, subsist chiefly on insects in their *aurelia* state. All the species of *wagtails* in severe weather haunt shallow streams near their spring-heads, where they never freeze; and, by wading, pick out the aurelias of the genus of * *Phryganeæ*, &c.

Hedge-sparrows frequent sinks and gutters in hard weather, where they pick up crumbs and other sweepings: and in mild weather they procure worms, which are stirring every month in the year, as any one may see that will only be at the trouble of taking a candle to a grass-plot on any mild winter's night. Red-breasts and wrens in the winter haunt out-houses, stables, and barns, where they find spiders and flies that have laid themselves up during the cold season. But the grand support of the soft-billed birds in winter is that infinite

* See *Derham's* Physico-theology, p. 235.

profusion of *aureliæ* of the *lepidoptera ordo*,[1] which is fastened to the twigs of trees and their trunks; to the pales and walls of gardens and buildings; and is found in every cranny and cleft of rock or rubbish, and even in the ground itself.

Every species of titmouse winters with us; they have what I call a kind of intermediate bill between the hard and the soft, between the *Linnæan* genera of *fringilla* and *motacilla*. One species alone spends it's whole time in the woods and fields, never retreating for succour in the severest seasons to houses and neighbourhoods; and that is the delicate long-tailed titmouse, which is almost as minute as the golden-crowned wren: but the blue titmouse, or nun (*parus cæruleus*), the cole-mouse (*parus ater*), the great black-headed titmouse (*fringillago*), and the marsh titmouse (*parus palustris*), all resort, at times, to buildings; and in hard weather particularly. The great titmouse, driven by stress of weather, much frequents houses; and in deep snows, I have seen this bird, while it hung with it's back downwards (to my no small delight and admiration), draw straws lengthwise from out the eaves of thatched houses, in order to pull out the flies that were concealed between them, and that in such numbers that they quite defaced the thatch, and gave it a ragged appearance.[2]

The blue *titmouse*, or *nun*, is a great frequenter of houses, and a general devourer. Besides insects, it is very fond of flesh; for it frequently picks bones on dunghills: it is a vast admirer of suet, and haunts butchers' shops. When a boy, I have known twenty in a morning caught with snap mouse-traps, baited with tallow or suet. It will also pick holes in apples left on the ground, and be well entertained with the seeds on the head of a sun-flower. The blue, marsh, and great titmice will, in very severe weather, carry away barley and oat straws from the sides of ricks.

How the *wheat-ear* and *whin-chat* support themselves in winter cannot be so easily ascertained, since they spend their time on wild heaths and warrens; the former especially, where there are stone quarries: most probably it is that their maintenance arises from

the *aureliæ* of the *lepidoptera ordo*, which furnish them with a plentiful table in the wilderness.

I am, &c.

[1] The chrysalids of butterflies and moths.

[2] In the eighteenth century when thatched houses were more common this amounted to a serious nuisance. Parson Woodforde's Diary contains a note for January 26, 1784: "I rejoiced much this morning on shooting an old Wood-pecker, which had teized me a long Time in pulling out the Reed from my House. He had been often shot at by me and others, but never could be a match for him till this Morn'. For the last 3 years in very cold Weather did he use to come here and destroy my Thatch. Many holes he has made this Year in the Roof, and as many before."

LETTER XLII

TO THE SAME

Selborne, *March* 9, 1775.

DEAR SIR,

SOME future *faunist*, a man of fortune, will, I hope, extend his visits to the kingdom of *Ireland*; a new field, and a country little known to the naturalist. He will not, it is to be wished, undertake that tour unaccompanied by a botanist, because the mountains have scarcely been sufficiently examined; and the southerly counties of so mild an island may possibly afford some plants little to be expected within the *British* dominions.[1] A person of a thinking turn of mind will draw many just remarks from the modern improvements of that country, both in arts and agriculture, where premiums obtained long before they were heard of with us. The manners of the wild natives, their superstitions, their prejudices, their sordid way of life, will extort from him many useful reflections. He should also take with him an able draughtsman; for he must by no means pass over the noble castles and seats, the extensive and picturesque lakes and waterfalls, and the lofty stupendous mountains, so little known, and so engaging to the imagination when described and exhibited in a lively manner: such a work would be well received.

As I have seen no modern map of *Scotland*, I cannot pretend

to say how accurate or particular any such may be; but this I know, that the best old maps of that kingdom are very defective.

The great obvious defect that I have remarked in all maps of *Scotland* that have fallen in my way is, a want of a *coloured line*, or *stroke*, that shall exactly define the just limits of that district called *The Highlands*. Moreover, all the great avenues to that mountainous and romantic country want to be well distinguished. The military roads formed by general *Wade* [2] are so great and Roman-like an undertaking that they well merit attention. My old map, *Moll's* Map, takes notice of *Fort William*; but could not mention the other forts that have been erected long since: therefore a good representation of the chain of forts should not be omitted.

The celebrated zigzag up the *Coryarich* must not be passed over. *Moll* takes notice of *Hamilton* and *Drumlanrig*, and such capital houses; but a new survey, no doubt, should represent every seat and castle remarkable for any great event, or celebrated for it's paintings, &c. Lord *Breadalbane's* seat and beautiful *policy* are too curious and extraordinary to be omitted.

The seat of the Earl of *Eglintoun*, near *Glasgow*, is worthy of notice. The pine-plantations of that nobleman are very grand and extensive indeed.

I am, &c.

[1] Such as London pride, the arbutus, and the fuchsia, which grow luxuriantly in the south-west.

[2] Field-Marshal Wade, M.P. for Bath in the reign of George I and George II, was entrusted with the pacification of the Highlands after the 1715 rebellion. Besides disarming the clans with great skill and tact he opened up the country by a series of great strategic roads, on which five hundred soldiers, whom he jokingly termed "highwaymen", were employed for three years.

LETTER XLIII

TO THE SAME

A PAIR of *honey-buzzards*,[1] *buteo apivorus, sive vespivorus Raii*, built them a large shallow nest, composed of twigs and lined with dead

beechen leaves, upon a tall slender beech near the middle of *Selborne-hanger*, in the summer of 1780. In the middle of the month of *June* a bold boy climbed this tree, though standing on so steep and dizzy a situation, and brought down an egg, the only one in the nest, which had been sat on for some time, and contained the embrio of a young bird. The egg was smaller, and not so round as those of the common buzzard,[2] was dotted at each end with small red spots, and surrounded in the middle with a broad bloody zone.

The hen-bird was shot,[3] and answered exactly to Mr. *Ray's* description of that species; had a black *cere*, short thick legs, and a long tail. When on the wing this species may be easily distinguished from the *common buzzard* by it's hawk-like appearance, small head, wings not so blunt, and longer tail. This specimen contained in it's craw some limbs of frogs and many grey snails without shells. The *irides* of the eyes of this bird were of a beautiful bright yellow colour.

About the tenth of *July* in the same summer a pair of *sparrow-hawks* bred in an old crow's nest [4] on a low beech in the same hanger; and as their brood, which was numerous, began to grow up, became so daring and ravenous, that they were a terror to all the dames in the village that had chickens or ducklings under their care. A boy climbed the tree, and found the young so fledged that they all escaped from him; but discovered that a good house had been kept: the larder was well-stored with provisions; for he brought down a young blackbird, jay, and house-martin, all clean picked, and some half devoured. The old birds had been observed to make sad havock for some days among the new-flown swallows and martins, which, being but lately out of their nests, had not acquired those powers and command of wing that enable them, when more mature, to set such enemies at defiance.

[1] The honey-buzzard, always a rare bird in England, was exterminated as a regular breeding-species about 1870, although isolated efforts, sometimes successful, continue to occur, and adequate protection may bring about a revival.

[2] As a rule the honey-buzzard lays two or three eggs, which are smaller and much rounder than the common buzzard's. The normal nest-lining is of fresh green leaves.

[3] In spite of this disaster the attempt to breed on the Hanger was not given up. *The Naturalist's Journal* for June 1781 has an entry: "The male still haunts about the hanger, and on sunny mornings soars above the hill to inhale the coolness of the upper air", or, as a modern observer would say, to make the fact of his holding territory there as conspicuous as possible to prospective rivals and a prospective mate. In 1787 a pair of honey-buzzards are noted as probably having young on the Hanger.

[4] It has been plausibly argued that these were hobbies, but most probably the author is correct.

LETTER XLIV

TO THE SAME

Selborne, *Nov.* 30, 1780.

DEAR SIR,

EVERY incident that occasions a renewal of our correspondence will ever be pleasing and agreeable to me.

As to the wild *wood-pigeon*,[1] the *oenas*, or *vinago*, of *Ray*, I am much of your mind; and see no reason for making it the origin of the common *house-dove*: but suppose those that have advanced that opinion may have been misled by another appellation, often given to the *oenas*, which is that of *stock-dove*.

Unless the stock-dove in the winter varies greatly in manners from itself in summer, no species seems more unlikely to be domesticated, and to make an *house-dove*. We very rarely see the latter settle on trees at all, nor does it ever haunt the woods; but the former, as long as it stays with us, from *November* perhaps to *February*, lives the same wild life with the *ring-dove, palumbus torquatus*; frequents coppices and groves, supports itself chiefly by mast, and delights to roost in the tallest beeches. Could it be known in what manner stock-doves build, the doubt would be settled with me at once, provided they construct their nests on trees, like the *ring-dove*, as I much suspect they do.

You received, you say, last spring a *stock-dove* from *Sussex*; and are informed that they sometimes breed in that country. But why did not your correspondent determine the place of it's nidification, whether on rocks, cliffs, or trees? If he was not an adroit ornithologist

I should doubt the fact, because people with us perpetually confound the *stock-dove* with the *ring-dove*.

For my own part, I readily concur with you in supposing that house-doves are derived from the *small blue rock-pigeon*, for many reasons. In the first place the wild stock-dove is manifestly larger than the common house-dove, against the usual rule of domestication, which generally enlarges the breed. Again, those two remarkable *black spots* on the remiges of each wing of the stock-dove, which are so characteristic of the species, would not, one should think, be totally lost by it's being reclaimed; but would often break out among its descendants. But what is worth an hundred arguments is, the instance you give in Sir *Roger Mostyn's* house-doves in *Caernarvonshire*; which, though tempted by plenty of food and gentle treatment, can never be prevailed on to inhabit their cote for any time; but, as soon as they begin to breed, betake themselves to the fastnesses of *Ormshead*, and deposit their young in safety amidst the inaccessible caverns and precipices of that stupendous promontory.

"Naturam expellas furcâ . . . tamen usque recurret."

I have consulted a sportsman, now in his seventy-eighth year, who tells me that fifty or sixty years back, when the beechen woods were much more extensive than at present, the number of wood-pigeons was astonishing; that he has often killed near twenty in a day; and that with a long wild-fowl piece he has shot seven or eight at a time on the wing as they came wheeling over his head: he moreover adds, which I was not aware of, that often there were among them little parties of small *blue doves*, which he calls *rockiers*.[2] The food of these numberless emigrants was beech-mast and some acorns; and particularly barley, which they collected in the stubbles. But of late years, since the vast increase of turnips,[3] that vegetable has furnished a great part of their support in hard weather; and the holes they pick in these roots greatly damage the crop. From this food their flesh has contracted a rancidness which occasions them to be rejected by nicer judges of eating, who thought them before a

delicate dish. They were shot not only as they were feeding in the fields, and especially in snowy weather, but also at the close of the evening, by men who lay in ambush among the woods and groves to kill them as they came in to roost.* These are the principal circumstances relating to this wonderful *internal* migration, which with us takes place towards the end of *November*, and ceases early in the spring. Last winter we had in *Selborne* high wood about an hundred of these doves; but in former times the flocks were so vast, not only with us but all the district round, that on mornings and evenings they traversed the air, like rooks, in strings, reaching for a mile together. When they thus rendezvoused here by thousands, if they happened to be suddenly roused from their roost-trees on an evening,

> "Their rising all at once was like the sound
> "Of thunder heard remote."——

It will by no means be foreign to the present purpose to add, that I had a relation in this neighbourhood who made it a practice, for a time, whenever he could procure the eggs of a *ring-dove*, to place them under a pair of doves that were sitting in his own pigeon-house; hoping thereby, if he could bring about a coalition, to enlarge his breed, and teach his own doves to beat out into the woods and to support themselves by mast: the plan was plausible, but something always interrupted the success; for though the birds were usually hatched, and sometimes grew to half their size, yet none ever arrived at maturity. I myself have seen these foundlings in their nest displaying a strange ferocity of nature, so as scarcely to bear to be looked at, and snapping with their bills by way of menace. In short, they always died, perhaps for want of proper sustenance: but the owner thought that by their fierce and wild demeanour they frighted their foster-mothers, and so were starved.

Virgil, as a familiar occurrence, by way of simile, describes a dove haunting the cavern of a rock in such engaging numbers, that

* Some old sportsmen say that the main part of these flocks used to withdraw as soon as the heavy *Christmas* frosts were over.

I cannot refrain from quoting the passage: and *John Dryden* has rendered it so happily in our language, that without farther excuse I shall add his translation also.

" Qualis speluncâ subitô commota Columba,
" Cui domus, et dulces latebroso in pumice nidi,
" Fertur in arva volans, plausumque exterrita pennis
" Dat tecto ingentem—mox aere lapsa quieto,
" Radit iter liquidum, celeres neque commovet alas."

" As when a dove her rocky hold forsakes,
" Rous'd, in a fright her sounding wings she shakes;
" The cavern rings with clattering:—out she flies,
" And leaves her callow care, and cleaves the skies:
" At first she flutters:—but at length she springs
" To smoother flight, and shoots upon her wings."

I am, &c.

[1] Not the ring-dove, at present known by that name, but the stock-dove which does not construct a nest on a tree, but lays in a hole in its " stock ", or failing that in crevices or rabbit-burrows. It breeds in most parts of England, including, at the present time, the parish of Selborne. Tame pigeons or " house-doves " are descended from the rock-dove.

[2] Either this informant was drawing an imaginary distinction or his " wood-pigeons " were ring-doves (as at present) and the " small blue doves which he calls rockiers " were stock-doves. No racial difference of size or plumage is distinguished among wintering birds, although there is wide variation in weight.

[3] This increase dates from about 1730 when Charles, 2nd Viscount Townshend, finally broke away from Sir Robert Walpole's ministry, and retiring to his seat at Raynham in Norfolk devoted the remaining eight years of his life to the improvement of agriculture, especially in this direction.

LETTER I

TO THE HONOURABLE DAINES BARRINGTON

Selborne, *June* 30, 1769.

DEAR SIR,

WHEN I was in town last month I partly engaged that I would sometime do myself the honour to write to you on the subject of natural

history: and I am the more ready to fulfil my promise, because I see you are a gentleman of great candour, and one that will make allowances; especially where the writer professes to be an *out-door naturalist*, one that takes his observations from the subject itself, and not from the writings of others.

The following is a LIST *of the* SUMMER BIRDS *of* PASSAGE *which I have discovered in this neighbourhood, ranged somewhat in the order in which they appear* [1] *:*

	RAII NOMINA.	USUALLY APPEARS ABOUT
1. Wryneck,	*Jynx, sive torquilla :*	The middle of *March* : harsh note.
2. Smallest willow-wren,	*Regulus non cristatus :*	*March* 23 : chirps till *September*.
3. Swallow,	*Hirundo domestica :*	*April* 13.
4. Martin,	*Hirundo rustica :*	Ditto.
5. Sand-martin,	*Hirundo riparia :*	Ditto.
6. Black-cap,	*Atricapilla :*	Ditto : a sweet wild note.
7. Nightingale,	*Luscinia :*	Beginning of *April*.
8. Cuckoo,	*Cuculus :*	Middle of *April*.
9. Middle willow-wren,	*Regulus non cristatus :*	Ditto: a sweet plaintive note.
10. White-throat,	*Ficedulæ affinis :*	Ditto : mean note; sings on till *September*.
11. Red-start,	*Ruticilla :*	Ditto : more agreeable song.
12. Stone-curlew,	*Oedicnemus :*	End of *March* : loud nocturnal whistle.
13. Turtle-dove,	*Turtur :*	
14. Grasshopper-lark,	*Alauda minima locustæ voce :*	Middle of *April* : a small sibilous note, till the end of *July*.
15. Swift,	*Hirundo apus :*	About *April* 27.
16. Less reed-sparrow,	*Passer arun inaceus minor :*	A sweet polyglot, but hurrying : it has the notes of many birds.
17. Land-rail,	*Ortygometra :*	A loud harsh note, crex, crex.

	RAII NOMINA.	USUALLY APPEARS ABOUT
18. Largest willow-wren,	*Regulus non cristatus :*	Cantat voce stridulâ locustæ; end of *April*, on the tops of high beeches.
19. Goat-sucker or fern-owl,	*Caprimulgus :*	Beginning of *May* : chatters by night with a singular noise.
20. Fly-catcher,	*Stoparola :*	*May* 12. A very mute bird: this is the latest summer bird of passage.

This assemblage of curious and amusing birds belongs to ten several genera of the *Linnæan* system; and are all of the *ordo* of *passeres* [2] save the *jynx* and *cuculus*, which are *picæ*, and the *charadrius* (*oedicnemus*) and *rallus* (*ortygometra*), which are *grallæ*.

These birds, as they stand numerically, belong to the following *Linnæan* genera :

1.	*Jynx :*	13. *Columba :*
2, 6, 7, 9, 10, 11, 16, 18.	*Motacilla :*	17. *Rallus :*
3, 4, 5, 15.	*Hirundo :*	19. *Caprimulgus :*
8.	*Cuculus :*	14. *Alauda :*
12.	*Charadrius :*	20. *Muscicapa.*

Most soft-billed birds live on insects, and not on grain and seeds; and therefore at the end of summer they retire : but the following soft-billed birds, though insect-eaters, stay with us the year rou nd:

	RAII NOMINA.	
Redbreast,	*Rubecula :*	These frequent houses ; and haunt outbuildings in the winter : eat spiders.
Wren,	*Passer troglodytes :*	
Hedge-sparrow,	*Curruca :*	Haunt sinks for crumbs and other sweepings.
White-wagtail,[3]	*Motacilla alba :*	These frequent shallow rivulets near the spring heads, where they never freeze : eat the aureliæ of Phryganea. The smallest birds that walk.
Yellow-wagtail,	*Motacilla flava :*	
Grey-wagtail,	*Motacilla cinerea :*	

	RAII NOMINA.	
Wheat-ear,	*Oenanthe :*	Some of these are to be seen with us the winter through.
Whin-chat,	*Oenanthe secunda :*	
Stone-chatter,	*Oenanthe tertia :*	
Golden-crowned wren,	*Regulus cristatus :*	This is the smallest British bird : haunts the tops of tall trees ; stays the winter through.

A LIST *of the* WINTER BIRDS *of* PASSAGE [4] *round this neighbourhood, ranged somewhat in the order in which they appear :*

1. Ring-ousel,[5]	*Merula torquata :*	This is a new migration which I have lately discovered about *Michaelmas* week, and again about the fourteenth of *March*.
2. Redwing,	*Turdus iliacus :*	About old *Michaelmas*.
3. Fieldfare,	*Turdus pilaris :*	Though a percher by day, roots on the ground.
4. Royston-crow,	*Cornix cinerea :*	Most frequent on downs.
5. Woodcock,[6]	*Scolopax :*	Appears about old *Michaelmas*.
6. Snipe,[6]	*Gallinago minor :*	Some snipes constantly breed with us.
7. Jack-snipe,	*Gallinago minima :*	
8. Wood-pigeon,[6]	*Oenas :*	Seldom appears till late : not in such plenty as formerly.
9. Wild-swan,	*Cygnus ferus :*	On some large waters.
10. Wild-goose,	*Anser ferus :*	
11. Wild-duck,[6]	*Anas torquata minor :*	On our lakes and streams.
12. Pochard,[6]	*Anas fera fusca :*	
13. Wigeon,	*Penelope :*	
14. Teal,[6] breeds with us in *Wolmer-forest*,	*Querquedula :*	
15. Gross-beak,[6]	*Coccothraustes :*	These are only wanderers that appear occasionally, and are not observant of any regular migration.
16. Cross-bill,	*Loxia :*	
17. Silk-tail,	*Garrulus bohemicus :*	

These birds, as they stand numerically, belong to the following *Linnæan* genera :

1, 2, 3,	*Turdus :*	9, 10, 11, 12, 13, 14,	
4,	*Corvus :*		*Anas :*
5, 6, 7,	*Scolopax :*	15, 16,	*Loxia :*
8,	*Columba :*	17.	*Ampelis.*

Birds that sing in the night are but few.

	RAII NOMINA.	
Nightingale,	*Luscinia :*	"In shadiest covert hid." MILTON.
Woodlark,	*Alauda arborea :*	Suspended in mid air.
Less reed-sparrow,[7]	*Passer arundinaceus minor :*	Among reeds and willows.

I should now proceed to such birds as continue to sing after *Midsummer*, but, as they are rather numerous, they would exceed the bounds of this paper : besides, as this is now the season for remarking on that subject, I am willing to repeat my observations on some birds concerning the continuation of whose song I seem at present to have some doubt.

I am, &c.

[1] A full synonymy of English and scientific names will be found on pages 408–412. The following are the species referred to above by names differing from those in use now : 2 (Chiffchaff) ; 9 (Willow-warbler or willow-wren) ; 14 (Grasshopper-warbler) ; 16 (Sedge-warbler) ; 18 (Wood-warbler or wood-wren) ; 19 (Nightjar) ; and 20 (Spotted flycatcher).

[2] 13 (turtle-dove) and 19 (Nightjar) have since been separated from Passeres, in addition to the exceptions named ; they now belong respectively to the orders *Columbae* and *Caprimulgi*, while of the others *Jynx* belongs to *Pici*, *Cuculus* to *Cuculi*, *Oedicnemus* (now *Burhinus*) to *Limicolæ*, and *Ortygometra* (now *Crex*) to *Alectorides*.

[3] The *white wagtail* in this case is the pied ; neither yellow wagtails nor whinchats winter in Britain, and their inclusion is no doubt a mistake ; the wheatear very rarely winters here. For a discussion of the point see page 64.

[4] The following are the species referred to in this list by an English name different from the one now in use ; 4 (Hoofed Crow) ; 8 (Stock-dove) ; 9 (undoubtedly the Whooper, which Bewick calls by the same names both in English and in Latin—it

was not till 1828 that the second species, Bewick's swan, was separated); 10 (the grey geese were not yet distinguished, but these were probably either White-fronted or Grey Lag, which are known to have occurred formerly in the vicinity; Pink-footed, Bernacle and Bean are possibilities); 11 (Mallard); 15 (Hawfinch); 17 (Waxwing).

[5] Actually a summer migrant to the British Isles.

[6] At present a breeding species resident in the district at all seasons.

[7] Sedge-warbler.

LETTER II

TO THE SAME

Selborne, *Nov.* 2, 1769.

DEAR SIR,

WHEN I did myself the honour to write to you about the end of last *June* on the subject of natural history, I sent you a list of the summer-birds of passage which I have observed in this neighbourhood; and also a list of the winter-birds of passage: I mentioned besides those soft-billed birds that stay with us the winter through in the south of *England*, and those that are remarkable for singing in the night.

According to my proposal, I shall now proceed to such birds (singing birds strictly so called) as continue in full song till after *Midsummer*; and shall range them somewhat in the order in which they first begin to open as the spring advances.

	RAII NOMINA.[1]	
1. Wood-lark,	*Alauda arborea:*	In *January*, and continues to sing through all the summer and autumn.
2. Song-thrush,	*Turdus simpliciter dictus:*	In *February* and on to *August*, reassume their song in autumn.
3. Wren,	*Passer troglodytes:*	All the year, hard frost excepted.
4. Redbreast,	*Rebecula:*	Ditto.

	RAII NOMINA.	
5. Hedge-sparrow,	*Curruca :*	Early in *February* to *July* the 10th.
6. Yellowhammer,	*Emberiza flava :*	Early in *February*, and on through *July* to *August* the 21st.
7. Skylark,	*Alauda vulgaris :*	In *February*, and on to *October*.
8. Swallow,	*Hirundo domestica :*	From *April* to *September*.
9. Black-cap,	*Atricapilla :*	Beginning of *April* to *July* 13th.
10. Titlark,	*Alauda pratorum :*	From middle of *April* to *July* the 16th.
11. Blackbird,	*Merula vulgaris :*	Sometimes in *February* and *March*, and so on to *July* the twenty-third; re-assumes in autumn.
12. White-throat,	*Ficedulæ affinis :*	In *April* and on to *July* 23.
13. Goldfinch,	*Carduelis :*	April and through to *September* 16.
14. Greenfinch,	*Chloris :*	On to *July* and *August* 2.
15. Less reed-sparrow,	*Passer arundinaceus minor :*	*May*, on to beginning of *July*.
16. Common linnet,	*Linaria vulgaris :*	Breeds and whistles on till *August*; reassumes it's note when they begin to congregate in *October*, and again early before the flock separate.

Birds that cease to be in full song, and are usually silent at or before *Midsummer* :

17. Middle willow-wren,	*Regulus non cristatus :*	Middle of *June*; begins in *April*.
18. Redstart,	*Ruticilla :*	Ditto : begins in *May*.
19. Chaffinch,	*Fringilla :*	Beginning of *June* : sings first in *February*.
20. Nightingale,	*Luscinia :*	Middle of *June* : sings first in *April*.

Birds that sing for a short time, and very early in the spring.

	RAII NOMINA.	
21. Missel-bird,	*Turdus viscivorus :*	*January* the 2d, 1770, in *February*. Is called in *Hampshire* and *Sussex* the storm-cock, because it's song is supposed to forebode windy wet weather : is the largest singing bird we have.
22. Great titmouse, or eye.	*Fringillago :*	In *February, March, April* : reassumes for a short time in *September*.

Birds that have somewhat of a note or song, and yet are hardly to be called singing birds :

23. Golden-crowned wren,	*Regulus cristatus :*	It's note as minute as it's person ; frequents the tops of high oaks and firs : the smallest *British* bird.
24. Marsh titmouse,	*Parus palustris :*	Haunts great woods : two harsh sharp notes.
25. Small willow-wren,	*Regulus non cristatus :*	Sings in *March* and on to *September*.
26. Largest ditto,	*Ditto :*	*Cantat voce stridulâ locustæ ;* from end of *April* to *August*.
27. Grasshopper-lark,	*Alauda minima voce locustæ :*	Chirps all night, from the middle of *April* to the end of *July*.
28. Martin,	*Hirundo agrestis :*	All the breeding time ; from *May* to *September*.
29. Bullfinch,	*Pyrrhula :*	
30. Bunting,	*Emberiza alba :*	From the end of *January* to *July*.

All singing birds, and those that have any pretensions to song not only in *Britain*, but perhaps the world through, come under the *Linnæan ordo* of *passeres*.[2]

The above-mentioned birds, as they stand numerically, belong to the following *Linnæan* genera.

1, 7, 10, 27.	*Alauda :*	8, 28.	*Hirundo.*
2, 11, 21.	*Turdus :*	13, 16, 19.	*Fringilla.*
3, 4, 5, 9, 12, 15, 17, 18, 20, 23, 25, 26.	*Motacilla :*	22, 24.	*Parus.*
6, 30.	*Emberiza :*	14, 29.	*Loxia.*

Birds that sing as they fly are but few.[3]

	RAII NOMINA.	
Skylark,	*Alauda vulgaris :*	Rising, suspended, and falling.
Titlark,	*Alauda pratorum :*	In it's descent; also sitting on trees, and walking on the ground.
Woodlark,	*Alauda arborea :*	Suspended; in hot summer nights all night long.
Blackbird,	*Merula :*	Sometimes from bush to bush.
White-throat,	*Ficedulæ affinis :*	Uses when singing on the wing odd jerks and gesticulations.
Swallow,	*Hirundo domestica :*	In soft sunny weather.
Wren,	*Passer troglodytes :*	Sometimes from bush to bush.

Birds that breed most early in these parts.

Raven,	*Corvus :*	Hatches in *February* and *March.*
Song-thrush,	*Turdus :*	In *March.*
Blackbird,	*Merula :*	In *March.*
Rook,	*Cornix frugilega :*	Builds the beginning of *March.*
Woodlark,	*Alauda arborea :*	Hatches in *April.*
Ring-dove,	*Palumbus torquatus :*	Lays the beginning of April.

All birds that continue in full song till after *Midsummer* appear to me to breed more than once.

Most kinds of birds seem to me to be wild and shy somewhat in proportion to their bulk; I mean in this island, where they are much pursued and annoyed: but in *Ascension Island*, and many other desolate places, mariners have found fowls so unacquainted with an human figure, that they would stand still to be taken; as is the case with boobies, &c. As an example of what is advanced, I remark that the *golden-crested wren* (the smallest *British* bird) will stand unconcerned till you come within three or four yards of it, while the *bustard* (*otis*), the largest *British* land fowl, does not care to admit a person within so many furlongs.

I am, &c.

[1] The following birds in these lists are now known by a different English name: 10 (the author did not distinguish between the tree- and meadow-pipits, but it is the former which is chiefly, if not exclusively, intended here); 15 (Sedge-warbler); 17 (Willow-warbler or willow-wren); 21 (Mistlethrush); 24 (most likely willow-titmouse, but the distinction between this and the marsh-titmouse was long unrecognised); 25 (Chiffchaff); 26 (Wood-warbler or wood-wren); 27 (Grasshopper-warbler); 30 (Corn-bunting).

[2] And they are still further restricted to one section of that order—the *Oscines*, which however contains as many existing species as all the other orders put together. But this only applies to song in the narrow conventional sense of a warbled refrain; from the standpoint of function the booming of bitterns, the craking of corncrakes, the drumming of woodpeckers and the nuptial piping of redshanks are equally songs, having the same significance.

[3] Other English birds that sing as they fly are the martin, goldfinch, wheatear, stonechat, rock-pipit, wood-wren, willow-wren, chaffinch, corn-bunting, mistlethrush, blackcap, nightingale, and Dartford warbler, but except with the first five and the last singing in flight is hardly habitual. Probably all songsters sometimes sing in flight.

LETTER III

TO THE SAME

Selborne, *Jan.* 15, 1770.

Dear Sir,

It was no small matter of satisfaction to me to find that you were not displeased with my little *methodus* of birds. If there was any

merit in the sketch, it must be owing to it's punctuality. For many months I carried a list in my pocket of the birds that were to be remarked, and, as I rode or walked about my business, I noted each day the continuance or omission of each bird's song; so that I am as sure of the certainty of my facts as a man can be of any transaction whatsoever.

I shall now proceed to answer the several queries which you put in your two obliging letters, in the best manner that I am able. Perhaps *Eastwick*, and it's environs, where you heard so very few birds, is not a woodland country, and therefore not stocked with such songsters. If you will cast your eye on my last letter, you will find that many species continued to warble after the beginning of *July*.

The titlark and yellowhammer breed late, the latter very late; and therefore it is no wonder that they protract their song: for I lay it down as a maxim in ornithology, that as long as there is any incubation going on there is music.[1] As to the redbreast and wren, it is well known to the most incurious observer that they whistle the year round, hard frost excepted; especially the latter.

It was not in my power to procure you a black-cap, or a less reed-sparrow, or sedge bird, alive. As the first is undoubtedly, and the last, as far as I can yet see, a summer bird of passage, they would require more nice and curious management in a cage than I should be able to give them: they are both distinguished songsters. The note of the former has such a wild sweetness that it always brings to my mind those lines in a song in "*As You Like It*".

> "And tune his merry note
> "Unto the *wild* bird's throat." SHAKESPEARE.

The latter has a surprising variety of notes resembling the song of several other birds; but then it has also an hurrying manner, not at all to it's advantage: it is notwithstanding a delicate polyglot.

It is new to me that titlarks in cages sing in the night; perhaps only caged birds do so. I once knew a tame redbreast in a cage that always sang as long as candles were in the room; but in their wild state no one supposes they sing in the night.

I should be almost ready to doubt the fact, that there are to be seen much fewer birds in *July* than in any former month, notwithstanding so many young are hatched daily. Sure I am that it is far otherwise with respect to the *swallow tribe*, which increases prodigiously as the summer advances: and I saw, at the time mentioned, many hundreds of young wagtails on the banks of the *Cherwell*,[2] which almost covered the meadows. If the matter appears as you say in the other species, may it not be owing to the dams being engaged in incubation, while the young are concealed by the leaves?

Many times have I had the curiosity to open the stomachs of *woodcocks* and *snipes*; but nothing ever occurred that helped to explain to me what their subsistence might be: all that I could ever find was a soft mucus, among which lay many pellucid small gravels.

I am, &c.

[1] In some species, such as the whitethroat, there appears to be little if any song while incubation is going on; certainly unmated males and those whose first broods have been destroyed are largely responsible for the continuance of song through the breeding season. A modern observer would be more inclined to say that as long as independent territory is held there is music, but the amount of it varies according to the extent of other claims on the energy of each male.

[2] At Oxford.

LETTER IV

TO THE SAME

Selborne, *Feb.* 19, 1770.

Dear Sir,

Your observation that "the *cuckoo* does not deposit it's egg indis- "criminately in the nest of the first bird that comes in it's way, "but probably looks out a nurse in some degree congenerous, with

" whom to intrust it's young," is perfectly new to me; and struck me so forcibly, that I naturally fell into a train of thought that led me to consider whether the fact was so, and what reason there was for it. When I came to recollect and inquire, I could not find that any cuckoo had ever been seen in these parts, except in the nest of the *wagtail*, the *hedge-sparrow*, the *titlark*, the *white-throat*, and the *redbreast*, all soft-billed insectivorous birds. The excellent Mr. *Willughby* mentions the nest of the *palumbus* (*ring-dove*), and of the *fringilla* (*chaffinch*), birds that subsist on acorns and grains, and such hard food: but then he does not mention them as of his own knowledge; but says afterwards that he saw himself a *wagtail* feeding a cuckoo. It appears hardly possible that a soft-billed bird should subsist on the same food with the hard-billed: for the former have thin membranaceous stomachs suited to their soft food; while the latter, the granivorous tribe, have strong muscular gizzards, which, like mills, grind, by the help of small gravels and pebbles, what is swallowed. This proceeding of the cuckoo, of dropping it's eggs as it were by chance, is such a monstrous outrage on maternal affection,[1] one of the first great dictates of nature; and such a violence on instinct; that, had it only been related of a bird in the *Brazils*, or *Peru*, it would never have merited our belief. But yet, should it farther appear that this simple bird, when divested of that natural στοργὴ that seems to raise the kind in general above themselves, and inspire them with extraordinary degrees of cunning and address, may be still endued with a more enlarged faculty of discerning what species are suitable and congenerous nursing-mothers for it's disregarded eggs and young, and may deposit them only under *their* care, this would be adding wonder to wonder, and instancing, in a fresh manner, that the methods of Providence are not subjected to any mode or rule, but astonish us in new lights, and in various and changeable appearances.

What was said by a very ancient and sublime writer concerning the defect of natural affection in the ostrich, may be well applied to the bird we are talking of:

" She is hardened against her young ones, as though they were not " her's :

" Because God hath deprived her of wisdom, neither hath he im- " parted to her understanding." *

Query. Does each female cuckoo lay but one egg in a season, or does she drop several in different nests according as opportunity offers?

I am, &c.

[1] The breeding of the cuckoo still has its obscure side, but the main outlines are no longer in doubt. Both males and females generally return to the same place every season ; recognisable males have been noted seven years running in Lancashire and nine at Hungerford. Females are outnumbered by males, but the reason and extent of this disparity are not clear. Cuckoos of both sexes hold definite spheres of influence, that of a female including several male territories. But these last are freely violated and the relation of the sexes is probably promiscuous rather than polyandrous. The eggs are laid at intervals of two days, from the middle of May onwards, but if necessary they can be held back after the proper laying-time. Though they vary enormously in colour, those of any given female are recognisably alike—that is, one female can only lay one type of egg. Further, each female shows a marked preference for a particular species of victim ; thus observers distinguish robin cuckoos, meadow-pipit cuckoos, reed-warbler cuckoos and so on. These preferences, and the different types of egg, may be hereditary, or partly so.

This breeding behaviour, which seems to rely for its success on a series of improbable accidents, is actually most strictly controlled. The element of chance is reduced to a minimum, though the behaviour of adult birds varies greatly. Some certainly lay directly in the nest, and it is at least possible that all do, though cuckoos' eggs are found in small domed or hole-nests where this would seem an almost miraculous feat for so large a bird. Only one egg is entrusted to each nest, although where the territories of two or more females overlap each may hit upon the same victim. Between 11 and 22 eggs are normally laid in a season. The female does not wait until opportunity offers, but creates her opportunities by deliberately controlling the supply of nests at a suitable stage through persecution of the foster species. More than sixty of these have been recorded in the British Isles, but by far the most usual are the meadow-pipit, hedge-sparrow, robin, pied wagtail, sedge-warbler, and reed-warbler. All these are " soft-billed ".

* Job xxxix. 16, 17.

LETTER V

TO THE SAME

Selborne, *April* 12, 1770.

DEAR SIR,

I HEARD many birds of several species sing last year after *Midsummer*; enough to prove that the summer solstice is not the period that puts a stop to the music of the woods. The yellowhammer no doubt persists with more steadiness than any other; but the woodlark, the wren, the redbreast, the swallow, the white-throat, the goldfinch, the common linnet, are all undoubted instances of the truth of what I advanced.

If this severe season does not interrupt the regularity of the summer migrations, the blackcap will be here in two or three days. I wish it was in my power to procure you one of those songsters; but I am no birdcatcher; and so little used to birds in a cage, that I fear if I had one it would soon die for want of skill in feeding.

Was your reed-sparrow, which you kept in a cage, the thick-billed reed-sparrow of the Zoology, p. 320; or was it the less reed-sparrow of *Ray*, the *sedge-bird* of Mr. *Pennant's* last publication, p. 16?

As to the matter of long-billed birds growing fatter in moderate frosts, I have no doubt within myself what should be the reason. The thriving at those times appears to me to arise altogether from the gentle check which the cold throws upon insensible perspiration. The case is just the same with blackbirds, &c.; and farmers and warreners observe, the first, that their hogs fat more kindly at such times, and the latter that their rabbits are never in such good case as in a gentle frost. But when frosts are severe, and of long continuance, the case is soon altered; for then a want of food soon overbalances the repletion occasioned by a checked perspiration. I have observed, moreover, that some human constitutions are more inclined to plumpness in winter than in summer.

When birds come to suffer by severe frost, I find that the first that fail and die are the redwing-fieldfares, and then the song-thrushes.

You wonder, with good reason, that the hedge-sparrows, &c., can be induced at all to sit on the egg of the cuckoo without being scandalized at the vast disproportioned size of the supposititious egg [1]; but the brute creation, I suppose, have very little idea of size, colour, or number. For the common hen, I know, when the fury of incubation is on her, will sit on a single shapeless stone instead of a nest full of eggs that have been withdrawn: and, moreover, a hen-turkey, in the same circumstances, would sit on in the empty nest till she perished with hunger.

I think the matter might be easily determined whether a cuckoo lays one or two eggs, or more, in a season, by opening a female during the laying-time. If more than one was come down out of the ovary, and advanced to a good size, doubtless then she would that spring lay more than one.

I will endeavour to get a hen, and to examine.

Your supposition that there may be some natural obstruction in singing birds while they are mute, and that when this is removed the song recommences, is new and bold: I wish you could discover some good grounds for this suspicion.

I was glad you were pleased with my specimen of the *caprimulgus*, or fern-owl; you were, I find, acquainted with the bird before.

When we meet, I shall be glad to have some conversation with you concerning the proposal you make of my drawing up an account of the animals in this neighbourhood. Your partiality towards my small abilities persuades you, I fear, that I am able to do more than is in my power: for it is no small undertaking for a man unsupported and alone to begin a natural history from his own autopsia! Though there is endless room for observation in the field of nature, which is boundless, yet investigation (where a man endeavours to be sure of his facts) can make but slow progress; and all that one could collect in many years would go into a very narrow compass.

Some extracts from your ingenious "Investigations of the difference between the present temperature of the air in Italy,"

&c., have fallen in my way; and gave me great satisfaction: they have removed the objections that always arose in my mind whenever I came to the passages which you quote. Surely the judicious *Virgil*, when writing a didactic poem for the region of *Italy*, could never think of describing freezing rivers, unless such severity of weather pretty frequently occurred!

P.S. Swallows appear amidst snows and frost.

[1] The difference in size between the egg of a cuckoo and that of its usual fosterers is comparatively slight, averaging about three or four millimetres each way. Nor are the species victimised entirely without discrimination; sometimes a spurious egg is deliberately ejected, or embedded in the bottom of the nest.

LETTER VI

TO THE SAME

Selborne, *May* 21, 1770.

DEAR SIR,

THE severity and turbulence of last month so interrupted the regular process of summer migration, that some of the birds do but just begin to shew themselves, and others are apparently thinner than usual; as the white-throat, the black-cap, the redstart, the fly-catcher. I well remember that after the very severe spring in the year 1739–40 summer birds of passage were very scarce. They come probably hither with a south-east wind, or when it blows between those points; but in that unfavourable year the winds blowed the whole spring and summer through from the opposite quarters. And yet amidst all these disadvantages two swallows, as I mentioned in my last, appeared this year as early as the eleventh of *April* amidst frost and snow; but they withdrew again for a time.

I am not pleased to find that some people seem so little satisfied with *Scopoli's* new publication;* there is room to expect great things from the hands of that man, who is a good naturalist: and one

* This work he calls his *Annus Primis Historico Naturalis.*

would think that an history of the birds of so distant and southern a region as *Carniola* would be new and interesting. I could wish to see that work, and hope to get it sent down. Dr. *Scopoli* is physician to the wretches that work in the quicksilver mines of that district.

When you talked of keeping a reed-sparrow, and giving it seeds, I could not help wondering; because the reed-sparrow which I mentioned to you (*passer arundinaceus minor Raii*) [1] is a soft-billed bird; and most probably migrates hence before winter; whereas the bird you kept (*passer torquatus Raii*) [1] abides all the year, and is a thick-billed bird. I question whether the latter be much of a songster; but in this matter I want to be better informed. The former has a variety of hurrying notes, and sings all night. Some part of the song of the former, I suspect, is attributed to the latter. We have plenty of the soft-billed sort; which Mr. *Pennant* had entirely left out of his *British Zoology*, till I reminded him of his omission. See *British Zoology* last published, p. 16.*

I have somewhat to advance on the different manners in which different birds fly and walk; but as this is a subject that I have not enough considered, and is of such a nature as not to be contained in a small space, I shall say nothing further about it at present.†

No doubt the reason why the sex of birds in their first plumage is so difficult to be distinguished is, as you say, "because they are "not to pair and discharge their parental functions till the ensuing "spring". As colours seem to be the chief external sexual distinction in many birds, these colours do not take place till sexual attachments begin to obtain. And the case is the same in quadrupeds; among whom, in their younger days, the sexes differ but little: but, as they advance to maturity, horns and shaggy manes, beards and brawny necks, &c. &c. strongly discriminate the male from the female. We may instance still farther in our own species, where a beard and stronger features are usually characteristic of the male sex: but this sexual diversity does not take place in earlier life;

* See letter xxv. to Mr. *Pennant*. † See letter xlii. to Mr. *Barrington*.

for a beautiful youth shall be so like a beautiful girl that the difference shall not be discernible;

" Quem si puellarum insereres choro,
" Mirè sagaces falleret hospites
" Discrimen obscurum, solutis
" Crinibus, ambiguoque vultu." HOR.

[1] The first mentioned is the sedge-warbler; the second the reed-bunting, whose song is poor and very brief.

LETTER VII

TO THE SAME

Ringmer, near Lewes, *Oct.* 8, 1770.

DEAR SIR,

I AM glad to hear that *Kuckalm* is to furnish you with the birds of *Jamaica*; a sight of the *hirundines* of that hot and distant island would be a great entertainment to me.

The *Anni* of *Scopoli* are now in my possession; and I have read the *Annus Primus* with satisfaction: for though some parts of this work are exceptionable, and he may advance some mistaken observations; yet the ornithology of so distant a country as *Carniola* is very curious. Men that undertake only one district are much more likely to advance natural knowledge than those that grasp at more than they can possibly be acquainted with: every kingdom, every province, should have it's own *monographer*.

The reason perhaps why he mentions nothing of *Ray's* Ornithology may be the extreme poverty and distance of his country, into which the works of our great naturalist may have never yet found their way. You have doubts, I know, whether this Ornithology is genuine, and really the work of *Scopoli*: as to myself, I think I discover strong tokens of authenticity; the style corresponds with that of his *Entomology*; and his characters of his Ordines and Genera are many of them new, expressive, and masterly. He has ventured to alter some of the *Linnæan genera* with sufficient shew of reasons.

It might perhaps be mere accident that you saw so many swifts and no swallows at *Staines*; because, in my long observation of those birds, I never could discover the least degree of rivalty or hostility between the species.[1]

Ray remarks that birds of the *gallinæ order*, as cocks and hens, partridges, and pheasants, &c. are *pulveratrices*, such as dust themselves, using that method of cleansing their feathers, and ridding themselves of their vermin. As far as I can observe, many birds that dust themselves never wash: and I once thought that those birds that wash themselves would never dust; but here I find myself mistaken; for common house-sparrows are great *pulveratrices*, being frequently seen grovelling and wallowing in dusty roads; and yet they are great washers. Does not the skylark dust?

Query. Might not *Mahomet* and his followers take one method of purification from these *pulveratrices*? because I find from travellers of credit, that if a strict mussulman is journeying in a sandy desert where no water is to be found, at stated hours he strips off his clothes, and most scrupulously rubs his body over with sand or dust.

A countryman told me he had found a young *fern-owl* in the nest of a small bird on the ground; and that it was fed by the little bird. I went to see this extraordinary phenomenon, and found that it was a young cuckoo hatched in the nest of a titlark: it was become vastly too big for it's nest, appearing

"— — — — — in tenui re
"Majores pennas nido extendisse — —"

and was very fierce and pugnacious, pursuing my finger, as I teazed it, for many feet from the nest, and sparring and buffetting with it's wings like a game-cock. The dupe of a dam appeared at a distance, hovering about with meat in it's mouth, and expressing the greatest solicitude.

In *July* I saw several cuckoos skimming over a large pond; and found, after some observation, that they were feeding on the *libellulæ*, or *dragon-flies*; some of which they caught as they settled on the weeds, and some as they were on the wing. Notwithstanding

what *Linnæus* says, I cannot be induced to believe that they are birds of prey.[2]

This district affords some birds that are hardly ever heard of at *Selborne*. In the first place considerable flocks of *cross-beaks* (*loxiæ curvirostræ*) have appeared this summer in the pine-groves belonging to this house; the *water-ousel* is said to haunt the mouth of the *Lewes* river, near *Newhaven*; and the *Cornish chough* builds, I know, all along the chalky cliffs of the *Sussex* shore.[3]

I was greatly pleased to see little parties of *ring-ousels* (my newly discovered migraters) scattered, at intervals, all along the *Sussex* downs from *Chichester* to *Lewes*. Let them come from whence they will, it looks very suspicious that they are cantoned along the coast in order to pass the channel when severe weather advances. They visit us again in *April*, as it should seem, in their return; and are not to be found in the dead of winter. It is remarkable that they are very tame, and seem to have no manner of apprehensions of danger from a person with a gun. There are bustards[4] on the wide downs near *Brighthelmstone*. No doubt you are acquainted with the *Sussex* downs: the prospects and rides round *Lewes* are most lovely!

As I rode along near the coast I kept a very sharp look out in the lanes and woods, hoping I might, at this time of the year, have discovered some of the summer short-winged birds of passage crowding towards the coast in order for their departure: but it was very extraordinary that I never saw a redstart, whitethroat, black-cap, uncrested wren, fly-catcher, &c. And I remember to have made the same remark in former years, as I usually come to this place annually about this time. The birds most common along the coast at present are the stone-chatters, whinchats, buntings, linnets, some few wheat-ears, titlarks, &c. Swallows and house-martins abound yet, induced to prolong their stay by this soft, still, dry season.

A land tortoise, which has been kept for thirty years in a little walled court belonging to the house where I now am visiting, retires under ground about the middle of *November*, and comes forth again about the middle of *April*. When it first appears in the spring it

discovers very little inclination towards food; but in the height of summer grows voracious: and then as the summer declines it's appetite declines; so that for the last six weeks in autumn it hardly eats at all. Milky plants, such as lettuces, dandelions, sowthistles, are it's favourite dish. In a neighbouring village one was kept till by tradition it was supposed to be an hundred years old. An instance of vast longevity in such a poor reptile!

[1] No appreciable rivalry exists, but above towns and certain other places the swift is often the only species found, for it feeds at a higher altitude and can live where the others cannot.

[2] The Pond was Oakhanger Pond. Linnæus did not accept the common myth that the cuckoo was changed into a hawk in winter, but he laid himself open to the author's criticism by saying (*Syst. Nat. XIIth Ed.* 1766): "semper cuculans advocat nutricem, donec sub ortu caniculae ingratus eum occidet devoretque, unde orbus victitet rapina Avicularum, Brassicae Larvisque aliarumque; non tamen in Falconem transformetur", which admits the hawk-like behaviour while denying the transformation. There is no doubt that the cuckoo is purely insectivorous.

[3] The water-ousel is the dipper and the Lewes river the Sussex Ouse, a hundred miles south-east of its nearest present haunt.

[4] The great bustard was already on the verge of extinction in England, though still surviving in East Anglia, on Salisbury Plain, and in handfuls elsewhere. Though they were extremely shy and wary, the great enclosure movement of this period and the new system of agriculture embarrassed them; a growing population and better organised persecution also told heavily on their numbers. By the end of the century bustards' eggs fetched half-a-guinea each, according to Montagu, and "young birds not full grown" ten or twelve guineas a pair. Their destruction having become so lucrative the remainder were very rapidly accounted for, and by 1840 the extinction was complete. Since then the species has only occurred as a vagrant, and attempts to re-establish it have met with no success. Brighthelmstone is the old form of Brighton.

LETTER VIII

TO THE SAME

Selborne, *Dec.* 20, 1770.

Dear Sir,

The birds that I took for *aberdavines* [1] were reed-sparrows (*passeres torquati*).

There are doubtless many home internal migrations within this

kingdom that want to be better understood: witness those vast flocks of hen chaffinches that appear with us in the winter without hardly any cocks among them. Now was there a due proportion of each sex, it should seem very improbable that any one district should produce such numbers of these little birds; and much more when only one half of the species appears: therefore we may conclude that the *fringillæ cælebes*, for some good purposes, have a peculiar migration of their own in which the sexes part. Nor should it seem so wonderful that the intercourse of sexes in this species of birds should be interrupted in winter; since in many animals, and particularly in bucks and does, the sexes herd separately, except at the season when commerce is necessary for the continuance of the breed. For this matter of the chaffinches see *Fauna Suecica*, p. 85, and *Systema Naturæ*, p. 318. I see every winter vast flights of hen chaffinches, but none of cocks.

Your method of accounting for the periodical motions of the *British* singing birds, or birds of flight, is a very probable one; since the matter of food is a great regulator of the actions and proceedings of the brute creation: there is but one that can be set in competition with it, and that is love. But I cannot quite acquiesce with you in one circumstance when you advance that, "when they have thus "feasted, they again separate into small parties of five or six, and "get the best fare they can within a certain district, having no induce-"ment to go in quest of fresh-turned earth". Now if you mean that the business of congregating is quite at an end from the conclusion of wheat-sowing to the season of barley and oats, it is not the case with us; for larks and chaffinches, and particularly linnets, flock and congregate as much in the very dead of winter as when the husbandman is busy with his ploughs and harrows.

Sure there can be no doubt but that woodcocks and fieldfares leave us in the spring,[2] in order to cross the seas, and to retire to some districts more suitable to the purpose of breeding. That the former pair before they retire, and that the hens are forward with egg, I myself, when I was a sportsman, have often experi-

enced. It cannot indeed be denied but that now and then we hear of a woodcock's nest, or young birds, discovered in some part or other of this island: but then they are always mentioned as rarities, and somewhat out of the common course of things: but as to redwings and fieldfares, no sportsman or naturalist has ever yet, that I could hear, pretended to have found the nest or young of those species in any part of these kingdoms. And I the more admire at this instance as extraordinary, since, to all appearance, the same food in summer as well as in winter might support them here which maintains their congeners, the blackbirds and thrushes, did they chuse to stay the summer through. From hence it appears that it is not food alone which determines some species of birds with regard to their stay or departure. Fieldfares and redwings disappear sooner or later according as the warm weather comes on earlier or later. For I well remember, after that dreadful winter of 1739–40,[3] that cold north-east winds continued to blow on through *April* and *May*, and that these kinds of birds (what few remained of them) did not depart as usual, but were seen lingering about till the beginning of *June*.

The best authority that we can have for the nidification of the birds above mentioned in any district, is the testimony of faunists that have written professedly the natural history of particular countries. Now, as to the fieldfare, *Linnæus*, in his Fauna Suecica, says of it that "*maximis in arboribus nidificat*"[4]: and of the redwing he says, in the same place, that "*nidificat in mediis arbusculis, sive sepibus*: "*ova sex cæruleo-viridia maculis nigris variis*".[5] Hence we may be assured that fieldfares and redwings breed in *Sweden*. *Scopoli* says, in his *Annus Primus*, of the wood-cock, that "*nupta ad nos* "*venit circa æquinoctium vernale*"[6]: meaning in *Tirol*, of which he is a native. And afterwards he adds "*nidificat in paludibus alpinis*: "*ova ponit* 3 - - - 5".[7] It does not appear from *Kramer* that woodcocks breed at all in *Austria*: but he says "*Avis hæc septentrionalium* "*provinciarum æstivo tempore incola est; ubi plerumque nidificat.* "*Appropinquante hyeme australiores provincias petit: hinc circa*

"*plenilunium mensis Octobris plerumque Austriam transmigrat. Tunc "rursus circa plenilunium potissimum mensis Martii per Austriam "matrimonio juncta ad septentrionales provincias redit.*" [8] For the whole passage (which I have abridged) see *Elenchus*, &c. p. 351. This seems to be a full proof of the migration of woodcocks; though little is proved concerning the place of breeding.

P.S. There fell in the county of *Rutland*, in three weeks of this present very wet weather, seven inches and an half of rain, which is more than has fallen in any three weeks for these thirty years past in that part of the world. A mean quantity in that county for one year is twenty inches and an half.

[1] Referring to an unpublished passage from Letter V (April 12th, 1770): the mistake was actually not detected until later. The aberdavine is the siskin.

[2] Woodcock, though best known as winter visitors, breed regularly in almost all parts of the British Isles in increasing strength; there are now a good many nesting pairs within a few miles of Selborne. Nests of the redwing and fieldfare have often been recorded in this country, but never satisfactorily authenticated.

[3] When Frost Fair was held on the frozen Thames at London.

[4] "It nests in the loftiest trees."

[5] "It nests in fair-sized bushes or hedges; eggs six, bluish-green with various black spots."

[6] "It comes to us, already mated, about the spring equinox."

[7] "It nests in Alpine swampy woods; it lays 3–5 eggs."

[8] "This bird is in summer an inhabitant of northern parts, where it breeds in numbers. On the approach of winter it makes for southern countries; hence it passes through Austria in numbers about the October full moon. Then again, preferably about the full moon of March, it returns mated through Austria to northern parts."

LETTER IX

TO THE SAME

Fyfield, near Andover, *Feb.* 12, 1771.

Dear Sir,

You are, I know, no great friend to migration; and the well attested accounts [1] from various parts of the kingdom seem to justify you in your suspicions, that at least many of the swallow kind do not leave

us in the winter, but lay themselves up like insects and bats, in a torpid state, and slumber away the more uncomfortable months till the return of the sun and fine weather awakens them.

But then we must not, I think, deny migration in general; because migration certainly does subsist in some places, as my brother in *Andalusia* has fully informed me. Of the motions of these birds he has ocular demonstration, for many weeks together, both spring and fall: during which periods myriads of the swallow kind traverse the Straits from north to south, and from south to north, according to the season. And these vast migrations consist not only of *hirundines* but of *bee-birds, hoopoes, oro pendolos,* or *golden thrushes,*[2] &c. &c. and also many of our *soft-billed summer-birds of passage*; and moreover of birds which never leave us, such as all the various sorts of hawks and kites. Old *Belon,*[3] two hundred years ago, gives a curious account of the incredible armies of hawks and kites which he saw in the spring-time traversing the *Thracian Bosphorus* from *Asia* to *Europe*. Besides the above mentioned, he remarks that the procession is swelled by whole troops of eagles and vultures.

Now it is no wonder that birds residing in *Africa* should retreat before the sun as it advances, and retire to milder regions, and especially birds of prey, whose blood being heated with hot animal food, are more impatient of a sultry climate: but then I cannot help wondering why kites and hawks, and such hardy birds as are known to defy all the severity of *England,* and even of *Sweden* and all north *Europe,* should want to migrate from the south of *Europe,* and be dissatisfied with the winters of *Andalusia*.

It does not appear to me that much stress may be laid on the difficulty and hazard that birds must run in their migrations, by reason of vast oceans, cross winds, &c.; because, if we reflect, a bird may travel from *England* to the equator without launching out and exposing itself to boundless seas, and that by crossing the water at *Dover,* and again at *Gibraltar*. And I with the more confidence advance this obvious remark, because my brother has always

found that some of his birds, and particularly the swallow kind, are very sparing of their pains in crossing the *Mediterranean*: for when arrived at *Gibraltar*, they do not

" — — — Rang'd in figure wedge their way,
" — — — — — And set forth
" Their airy caravan high over seas
" Flying, and over lands with mutual wing
" Easing their flight: — — — — " MILTON.

but scout and hurry along in little detached parties of six or seven in a company; and sweeping low, just over the surface of the land and water, direct their course to the opposite continent at the narrowest passage they can find. They usually slope across the bay to the south-west, and so pass over opposite to *Tangier*, which, it seems, is the narrowest space.

In former letters we have considered whether it was probable that woodcocks in moon-shiny nights cross the *German* ocean from *Scandinavia*. As a proof that birds of less speed may pass that sea, considerable as it is, I shall relate the following incident, which, though mentioned to have happened so many years ago, was strictly matter of fact:—As some people were shooting in the parish of *Trotton*, in the county of *Sussex*, they killed a duck in that dreadful winter 1708–9, with a silver collar about it's neck,* in which were engraven the arms of the king of *Denmark*. This anecdote the rector of *Trotton* at that time has often told to a near relation of mine; and, to the best of my remembrance, the collar was in the possession of the rector.[4]

At present I do not know any body near the sea-side that will take the trouble to remark at what time of the moon woodcocks first come: if I lived near the sea myself I would soon tell you more of the matter. One thing I used to observe when I was a sportsman, that there were times in which woodcocks were so sluggish and sleepy that they would drop again when flushed just before the spaniels,

* I have read a like anecdote of a swan.

nay just at the muzzle of a gun that had been fired at them: whether this strange laziness was the effect of a recent fatiguing journey I shall not presume to say.

Nightingales not only never reach *Northumberland* and *Scotland*, but also, as I have been always told, *Devonshire* and *Cornwall*. In those two last counties we cannot attribute the failure of them to the want of warmth: the defect in the west is rather a presumptive argument that these birds come over to us from the continent at the narrowest passage, and do not stroll so far westward.[5]

Let me hear from your own observation whether skylarks do not dust. I think they do: and if they do, whether they wash also.

The *alauda pratensis*[6] of *Ray* was the poor dupe that was educating the booby of a cuckoo mentioned in my letter of *October* last.

Your letter came too late for me to procure a ring-ousel for Mr. *Tunstal*[7] during their autumnal visit; but I will endeavour to get him one when they call on us again in *April*. I am glad that you and that gentleman saw my *Andalusian* birds; I hope they answered your expectation. *Royston*, or grey crows, are winter birds that come much about the same time with the woodcock: they, like the fieldfare and redwing, have no apparent reason for migration; for as they fare in the winter like their congeners, so might they in all appearance in the summer. Was not *Tenant*, when a boy, mistaken? did he not find a missel-thrush's nest, and take it for the nest of a fieldfare?

The stock-dove, or wood-pigeon, *ænas Raii*, is the last winter bird of passage which appears with us; and is not seen till towards the end of *November*: about twenty years ago they abounded in the district of *Selborne*; and strings of them were seen morning and evening that reached a mile or more: but since the beechen woods have been greatly thinned they are much decreased in number. The ring-dove, *palumbus Raii*, stays with us the whole year, and breeds several times through the summer.

Before I received your letter of *October* last I had just remarked in my journal that the trees were unusually green. This uncommon verdure lasted on late into *November*; and may be accounted for from a late spring, a cool and moist summer; but more particularly from vast armies of chafers, or tree-beetles, which, in many places, reduced whole woods to a leafless naked state. These trees shot again at *Midsummer*, and then retained their foliage till very late in the year.

My musical friend,[8] at whose house I am now visiting, has tried all the owls that are his near neighbours with a pitch-pipe set at concert-pitch, and finds they all hoot in B flat. He will examine the nightingales next spring.

I am, &c. &c.

[1] For a summary of these see pages 42–46 of the Introduction.

[2] Golden orioles.

[3] Pierre Belon (1517–64) wrote the best of the sixteenth-century works on ornithology—a History of Birds. He was murdered in the Bois de Boulogne.

[4] It has been suggested that this bird was really a cormorant which had been used for fishing according to the familiar method. While that is not impossible, the cormorant has always been a well-known species, and it is hard to believe that so crude an error should have passed undetected. There is no reason to suspect that Danish cormorants winter with us, nor in any case would they be likely to occur inland; Danish duck, on the other hand, cross the North Sea in large numbers, and there would be nothing extraordinary about finding one at Trotton, which is on the Western Rother. There is a very similar case on record of a swan bearing round its neck a gold medal inscribed "le Roi Dame", and supposed to have come from Denmark, which was shot on Foulness in Essex during February 1776. Here certainly there can have been no mistake over the species; and this was most probably the bird referred to in the author's own note. Recently in Denmark and all the Baltic lands, Hungary, Holland, the British Isles and North America the possibilities of bird-marking with numbered rings of light metal, attached to the leg, have been exploited on a considerable scale, and many records of such sea-crossings (including several Transatlantic flights by gulls and terns) are now fully established.

[5] The range of the nightingale in the British Isles seems to have been slightly extended in modern times, but is roughly bounded on the north and west by a line drawn from Flamborough through Harrogate, Manchester and Chester, across Wales to Swansea, and thence through Devon to Torquay. Within this south-eastern part of Britain it is a summer visitor to suitable thickets, gardens and woods, plentiful in Sussex, Hampshire, Berkshire, the Home Counties and East Anglia, becoming rarer

towards the north and west limits of its range. It has never been found, even as a straggler, on the mainland of Scotland, Ireland, or Cornwall.

[6] The meadow-pipit, one of the most common foster species of the cuckoo.

[7] Marmaduke Tunstall (1743–90), one of the earliest British collectors, whose private museum in Welbeck Street (after 1776 at Wycliffe, Yorkshire) was at this time considered one of the finest collections of birds in existence. The specimens were twice sold after his death and eventually in 1822 became the nucleus of Newcastle Museum. The Andalusian birds were obtained by the author's brother, the Rev. John White, then Chaplain at Gibraltar.

[8] The author's brother, the Rev. Henry White, Rector of Fyfield, Hampshire.

LETTER X

TO THE SAME

Selborne, *Aug.* 1, 1771.

DEAR SIR,

FROM what follows, it will appear that neither owls nor cuckoos keep to one note. A friend remarks that many (most) of his owls hoot in B flat; but that one went almost half a note below A. The pipe he tried their notes by was a common half-crown pitch-pipe, such as masters use for tuning of harpsichords; it was the common *London* pitch.

A neighbour of mine, who is said to have a nice ear, remarks that the owls about this village hoot in three different keys, in G flat, or F sharp, in B flat and A flat. He heard two hooting to each other, the one in A flat, and the other in B flat. *Query*: Do these different notes proceed from different species, or only from various individuals? The same person finds upon trial that the note of the cuckoo (of which we have but one species) varies in different individuals; for, about *Selborne* wood, he found they were mostly in D: he heard two sing together, the one in D, the other in D sharp, who made a disagreeable concert: he afterwards heard one in D sharp, and about *Wolmer-forest* some in C. As to nightingales, he says that their notes are so short, and their transitions so rapid, that he cannot well ascertain their key. Perhaps in a cage, and in

a room, their notes may be more distinguishable. This person has tried to settle the notes of a swift, and of several other small birds, but cannot bring them to any criterion.

As I have often remarked that redwings are some of the first birds that suffer with us in severe weather, it is no wonder at all that they retreat from *Scandinavian* winters: and much more the *ordo* of *grallæ*, who, all to a bird, forsake the northern parts of *Europe* at the approach of winter. "*Grallæ tanquam conjuratæ unanimiter* "*in fugam se conjiciunt; ne earum unicam quidem inter nos habitantem* "*invenire possimus; ut enim æstate in australibus degere nequeunt* "*ob defectum lumbricorum, terramque siccam; ita nec in frigidis ob* "*eandem causam,*"[1] says *Eckmark* the *Swede*, in his ingenious little treatise called *Migrationes Avium*, which by all means you ought to read while your thoughts run on the subject of migration. See *Amœnitates Academicæ*, vol. 4, p. 565.

Birds may be so circumstanced as to be obliged to migrate in one country and not in another: but the *grallæ*, (which procure their food from marshes and boggy grounds) must in winter forsake the more northerly parts of *Europe*, or perish for want of food.

I am glad you are making inquiries from *Linnæus* concerning the woodcock: it is expected of him that he should be able to account for the motions and manner of life of the animals of his own *Fauna*.

Faunists, as you observe, are too apt to acquiesce in bare descriptions, and a few synonyms: the reason is plain; because all that may be done at home in a man's study, but the investigation of the life and conversation of animals, is a concern of much more trouble and difficulty, and is not to be attained but by the active and inquisitive, and by those that reside much in the country.

Foreign systematics are, I observe, much too vague in their specific differences; which are almost universally constituted by one or two particular marks, the rest of the description running in general terms. But our countryman, the excellent Mr. *Ray*,

is the only describer that conveys some precise idea in every term, or word, maintaining his superiority over his followers and imitators in spite of the advantage of fresh discoveries and modern information.

At this distance of years it is not in my power to recollect at what periods woodcocks used to be sluggish or alert when I was a sportsman: but, upon my mentioning this circumstance to a friend, he thinks he has observed them to be remarkably listless against snowy foul weather: if this should be the case, then the inaptitude for flying arises only from an eagerness for food; as sheep are observed to be very intent on grazing against stormy wet evenings.

I am, &c. &c.

[1] "The Rail Kind flee away with one accord as of by a conspiracy, nor can we find even a single one of them living amongst us; for as in summer they are unable to exist in southern countries on account of the failure of worms and the parched earth, so in arctic ones, for the same reason."

LETTER XI

TO THE SAME

Selborne, *Feb.* 8, 1772.

Dear Sir,

When I ride about in the winter, and see much prodigious flocks of various kinds of birds, I cannot help admiring at these congregations, and wishing that it was in my power to account for those appearances almost peculiar to the season. The two great motives which regulate the proceedings of the brute creation are love and hunger; the former incites animals to perpetuate their kind, the latter induces them to preserve individuals: whether either of these should seem to be the ruling passion in the matter of congregating is to be considered. As to love, that is out of the question at a time of the year when that soft passion is not indulged: besides, during

the amorous season, such a jealousy prevails between the male birds that they can hardly bear to be together in the same hedge or field. Most of the singing and elation of spirits of that time seem to me to be the effect of rivalry and emulation : and it is to this spirit of jealousy that I chiefly attribute the equal dispersion of birds in the spring over the face of the country.

Now as to the business of food : as these animals are actuated by instinct to hunt for necessary food, they should not, one would suppose, crowd together in pursuit of sustenance at a time when it is most likely to fail ; yet such associations do take place in hard weather chiefly, and thicken as the severity increases. As some kind of self-interest and self-defence is no doubt the motive for the proceeding, may it not arise from the helplessness of their state in such rigorous seasons ; as men crowd together, when under great calamities, though they know not why? Perhaps approximation may dispel some degree of cold ; and a crowd may make each individual appear safer from the ravages of birds of prey and other dangers.

If I admire when I see how much congenerous birds love to congregate, I am the more struck when I see incongruous ones in such strict amity. If we do not much wonder to see a flock of rooks usually attended by a train of daws, yet it is strange that the former should so frequently have a flight of starlings for their satellites. Is it because rooks have a more discerning scent than their attendants, and can lead them to spots more productive of food? Anatomists say that rooks, by reason of two large nerves [1] which run down between the eyes into the upper mandible, have a more delicate feeling in their beaks than other round-billed birds, and can grope for their meat when out of sight. Perhaps then their associates attend them on the motive of interest, as greyhounds wait on the motions of their finders ; and as lions are said to do on the yelpings of jackalls. Lapwings and starlings sometimes associate.

[1] The orbito-nasal nerves, running down either side of the bill ; they are not abnormally developed in a rook as compared with other species.

LETTER XII

TO THE SAME

March 9, 1772.

DEAR SIR,

As a gentleman [1] and myself were walking on the fourth of last *November* round the sea-banks at *Newhaven*, near the mouth of the *Lewes* river, in pursuit of natural knowledge, we were surprised to see three house-swallows gliding very swiftly by us. That morning was rather chilly, with the wind at north-west; but the tenor of the weather for some time before had been delicate, and the noons remarkably warm. From this incident, and from repeated accounts which I meet with, I am more and more induced to believe that many of the swallow kind do not depart from this island; but lay themselves up in holes and caverns; and do, insect-like and bat-like, come forth at mild times, and then retire again to their *latebræ*. Nor make I the least doubt but that, if I lived at *Newhaven*, *Seaford*, *Brighthelmstone*, or any of those towns near the chalk-cliffs of the *Sussex* coast, by proper observations, I should see swallows stirring at periods of the winter, when the noons were soft and inviting, and the sun warm and invigorating. And I am the more of this opinion from what I have remarked during some of our late springs, that though some swallows did make their appearance about the usual time, *viz.* the thirteenth or fourteenth of *April*, yet meeting with an harsh reception, and blustering cold north-east winds, they immediately withdrew, absconding for several days, till the weather gave them better encouragement.

[1] The author's brother, Thomas White, F.R.S.

LETTER XIII

TO THE SAME

April 12, 1772.

DEAR SIR,

WHILE I was in *Sussex* last autumn my residence was at the village near *Lewes*,[1] from whence I had formerly the pleasure of writing to

you. On the first of *November* I remarked that the old tortoise, formerly mentioned, began first to dig the ground in order to the forming it's hybernaculum, which it had fixed on just beside a great tuft of hepaticas. It scrapes out the ground with it's fore-feet, and throws it up over it's back with it's hind; but the motion of it's legs is ridiculously slow, little exceeding the hour-hand of a clock; and suitable to the composure of an animal said to be a whole month in performing one feat of copulation. Nothing can be more assiduous than this creature night and day in scooping the earth, and forcing it's great body into the cavity; but, as the noons of that season proved unusually warm and sunny, it was continually interrupted, and called forth by the heat in the middle of the day; and though I continued there till the thirteenth of *November*, yet the work remained unfinished. Harsher weather, and frosty mornings, would have quickened it's operations. No part of it's behaviour ever struck me more than the extreme timidity it always expresses with regard to rain; for though it has a shell that would secure it against the wheel of a loaded cart, yet does it discover as much solicitude about rain as a lady dressed in all her best attire, shuffling away on the first sprinklings, and running it's head up in a corner. If attended to, it becomes an excellent weather-glass; for as sure as it walks elate, and as it were on tiptoe, feeding with great earnestness in a morning, so sure will it rain before night. It is totally a diurnal animal, and never pretends to stir after it becomes dark. The tortoise, like other reptiles, has an arbitrary stomach as well as lungs; and can refrain from eating as well as breathing for a great part of the year. When first awakened it eats nothing; nor again in the autumn before it retires: through the height of the summer it feeds voraciously, devouring all the food that comes in it's way. I was much taken with it's sagacity in discerning those that do it kind offices: for, as soon as the good old lady [2] comes in sight who has waited on it for more than thirty years, it hobbles towards it's benefactress with aukward alacrity; but remains inattentive to strangers. Thus not only "*the ox knoweth his owner, and the ass his master's*

crib," * but the most abject reptile and torpid of beings distinguishes the hand that feeds it, and is touched with the feelings of gratitude !

I am, &c. &c.

P.S. In about three days after I left *Sussex* the tortoise retired into the ground under the hepatica.

[1] Ringmer.

[2] The author's aunt, Rebecca Snooke, on whose death in 1780 the tortoise was brought to Selborne.

LETTER XIV

TO THE SAME

Selborne, *March* 26, 1773.

DEAR SIR,

THE more I reflect on the στοργη of animals, the more I am astonished at it's effects. Nor is the violence of this affection more wonderful than the shortness of it's duration. Thus every hen is in her turn the virago of the yard, in proportion to the helplessness of her brood; and will fly in the face of a dog or a sow in defence of those chickens, which in a few weeks she will drive before her with relentless cruelty.

This affection sublimes the passions, quickens the invention, and sharpens the sagacity of the brute creation. Thus an hen, just become a mother, is no longer that placid bird she used to be, but with feathers standing on end, wings hovering, and clocking note, she runs about like one possessed. Dams will throw themselves in the way of the greatest danger in order to avert it from their progeny. Thus a partridge will tumble along before a sportsman in order [1] to draw away the dogs from her helpless covey. In the time of nidification the most feeble birds will assault the most rapacious. All the hirundines of a village are up in arms at the sight of an hawk, whom they will persecute till he leaves that district. A very exact observer has often remarked that a pair of ravens nesting

* Isaiah i. 3.

in the rock of *Gibraltar* would suffer no vulture or eagle to rest near their station, but would drive them from the hill with an amazing fury: even the blue thrush [2] at the season of breeding would dart out from the clefts of the rocks to chase away the kestril, or the sparrow-hawk. If you stand near the nest of a bird that has young, she will not be induced to betray them by an inadvertent fondness, but will wait about at a distance with meat in her mouth for an hour together.

Should I farther corroborate what I have advanced above by some anecdotes which I probably may have mentioned before in conversation, yet you will, I trust, pardon the repetition for the sake of the illustration.

The flycatcher of the Zoology (the *stoparola* of *Ray*) builds every year in the vines that grow on the walls of my house. A pair of these little birds had one year inadvertently placed their nest on a naked bough, perhaps in a shady time, not being aware of the inconvenience that followed. But an hot sunny season coming on before the brood was half fledged, the reflection of the wall became insupportable, and must inevitably have destroyed the tender young, had not affection suggested an expedient, and prompted the parent-birds to hover over the nest all the hotter hours, while with wings expanded, and mouths gasping for breath, they screened off the heat from their suffering offspring.

A farther instance I once saw of notable sagacity in a willow-wren, which had built in a bank in my fields. This bird a friend and myself had observed as she sat in her nest; but were particularly careful not to disturb her, though we saw she eyed us with some degree of jealousy. Some days after as we passed that way we were desirous of remarking how this brood went on; but no nest could be found, till I happened to take up a large bundle of long green moss, as it were, carelessly thrown over the nest in order to dodge the eye of any impertinent intruder.

A still more remarkable mixture of sagacity and instinct occurred to me one day as my people were pulling off the lining of an hotbed, in order to add some fresh dung. From out of the side of this bed leaped an animal with great agility that made a most grotesque figure;

nor was it without great difficulty that it could be taken; when it proved to be a large white-bellied field-mouse [3] with three or four young clinging to her teats by their mouths and feet. It was amazing that the desultory and rapid motions of this dam should not oblige her litter to quit their hold, especially when it appeared that they were so young as to be both naked and blind!

To these instances of tender attachment, many more of which might be daily discovered by those that are studious of nature, may be opposed that rage of affection, that monstrous perversion of the *στοργη*, which induces some females of the brute creation to devour their young because their owners have handled them too freely, or removed them from place to place! Swine, and sometimes the more gentle race of dogs and cats, are guilty of this horrid and preposterous murder. When I hear now and then of an abandoned mother that destroys her offspring, I am not so much amazed; since reason perverted, and the bad passions let loose, are capable of any enormity: but why the parental feelings of brutes, that usually flow in one most uniform tenor, should sometimes be so extravagantly diverted, I leave to abler philosophers than myself to determine.

I am, &c.

[1] More likely the injury-feigning is not deliberate, but is a spontaneous manifestation of the instincts to defend the brood and to flee from danger, here in such violent opposition as to have a temporarily paralysing effect. When a bird so paralysed is pursued, the personal danger becomes the more pressing, fear becomes uppermost and it takes flight, after unintentionally decoying the enemy away from the brood.

[2] The blue rock-thrush, a Mediterranean species.

[3] Probably the long-tailed field-mouse.

LETTER XV

TO THE SAME

Selborne, *July* 8, 1773.

Dear Sir,

Some young men went down lately to a pond on the verge of *Wolmer-forest* to hunt flappers, or young wild-ducks, many of which they

caught, and, among the rest, some very minute yet well-fledged wild-fowls alive, which upon examination I found to be teals. I did not know till then that teals ever bred in the south of *England*, and was much pleased with the discovery: this I look upon as a great stroke in natural history.

We have had, ever since I can remember, a pair of white owls that constantly breed under the eaves of this church. As I have paid good attention to the manner of life of these birds during their season of breeding, which lasts the summer through, the following remarks may not perhaps be unacceptable:—About an hour before sunset (for then the mice begin to run) they sally forth in quest of prey, and hunt all round the hedges of meadows and small enclosures for them, which seem to be their only food. In this irregular country we can stand on an eminence and see them beat the fields over like a setting-dog, and often drop down in the grass or corn. I have minuted these birds with my watch for an hour together, and have found that they return to their nests, the one or the other of them, about once in five minutes; reflecting at the same time on the adroitness that every animal is possessed of as far as regards the well being of itself and offspring. But a piece of address, which they shew when they return loaded, should not, I think, be passed over in silence.—As they take their prey with their claws, so they carry it in their claws to their nest: but, as the feet are necessary in their ascent under the tiles, they constantly perch first on the roof of the chancel, and shift the mouse from their claws to their bill, that the feet may be at liberty to take hold of the plate on the wall as they are rising under the eaves.

White owls seem not (but in this I am not positive) to hoot [1] at all: all that clamorous hooting appears to me to come from the wood kinds. The white owl does indeed snore and hiss in a tremendous manner; and these menaces well answer the intention of intimidating: for I have known a whole village up in arms on such an occasion, imagining the church-yard to be full of goblins and spectres. White owls also often scream horribly as they fly along;

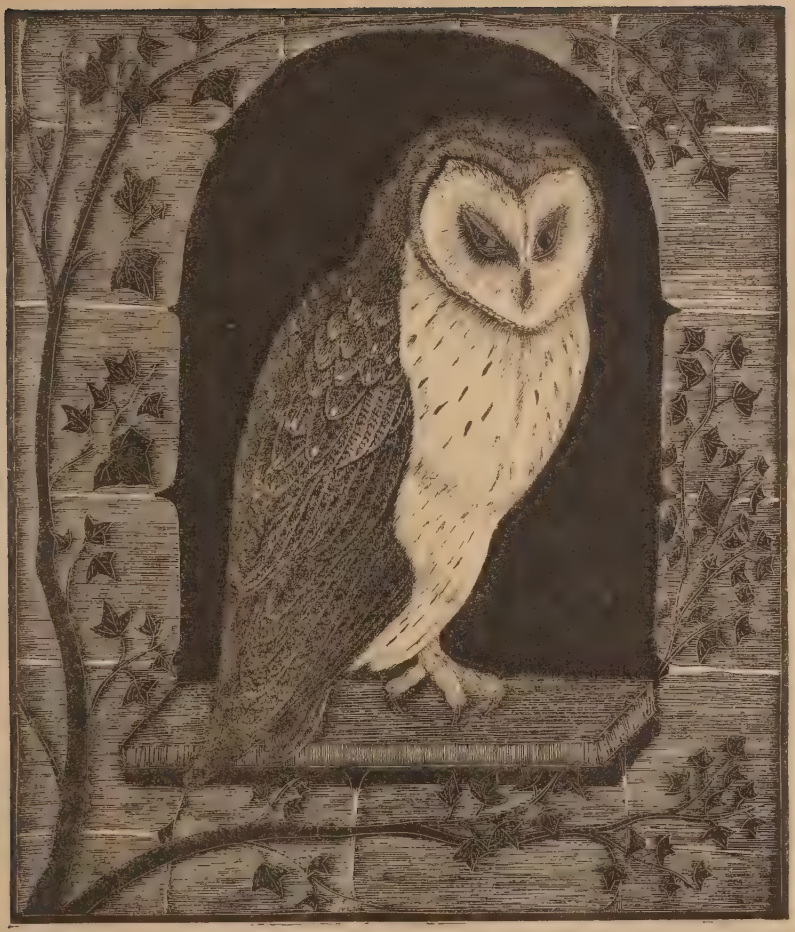
from this screaming probably arose the common people's imaginary species of *screech-owl*, which they superstitiously think attends the windows of dying persons. The plumage of the remiges of the wings of every species of owl that I have yet examined is remarkably soft and pliant. Perhaps it may be necessary that the wings of these birds should not make much resistance or rushing, that they may be enabled to steal through the air unheard [2] upon a nimble and watchful quarry.

While I am talking of owls, it may not be improper to mention what I was told by a gentleman of the county of *Wilts*. As they were grubbing a vast hollow pollard-ash that had been the mansion of owls for centuries, he discovered at the bottom a mass of matter that at first he could not account for. After some examination, he found it was a congeries of the bones of mice (and perhaps of birds and bats) that had been heaping together for ages, being cast up in pellets out of the crops of many generations of inhabitants. For owls cast up the bones, fur, and feathers, of what they devour, after the manner of hawks. He believes, he told me, that there were bushels of this kind of substance.

When brown owls hoot their throats swell as big as an hen's egg. I have known an owl of this species live a full year without any water.[3] Perhaps the case may be the same with all birds of prey. When owls fly they stretch out their legs behind them as a balance to their large heavy heads: for as most nocturnal birds have large eyes and ears they must have large heads to contain them. Large eyes I presume are necessary to collect every ray of light, and large concave ears to command the smallest degree of sound or noise.

I am, etc.

It will be proper to premise here that the sixteenth, eighteenth, twentieth and twenty-first letters have been published already in the Philosophical Transactions: but as nicer observation has furnished several corrections and additions, it is hoped that the republication of them will not give offence; especially as



these sheets would be very imperfect without them, and as they will be new to many readers who had no opportunity of seeing them when they made their first appearance.

The *hirundines* are a most inoffensive, harmless, entertaining, social, and useful tribe of birds: they touch no fruit in our gardens; delight, all except one species, in attaching themselves to our houses; amuse us with their migrations, songs, and marvellous agility; and clear our outlets from the annoyances of gnats and other troublesome insects. Some districts in the south seas, near *Guiaquil*,* [4] are desolated, it seems, by the infinite swarms of venomous mosquitoes, which fill the air, and render those coasts insupportable. It would be worth inquiring whether any species of *hirundines* is found in those regions. Whoever contemplates the myriads of insects that sport in the sunbeams of a summer evening in this country, will soon be convinced to what a degree our atmosphere would be choaked with them was it not for the friendly interposition of the swallow tribe.

Many species of birds have their peculiar *lice*; but the *hirundines* alone seem to be annoyed with *dipterous* insects, which infest every species, and are so large, in proportion to themselves, that they must be extremely irksome and injurious to them. These are the *hippoboscæ hirundinis*,[5] with narrow subulated wings, abounding in every nest; and are hatched by the warmth of the bird's own body during incubation, and crawl about under its feathers.

A *species* [6] of them is familiar to horsemen in the south of *England* under the name of *forest-fly*; and to some of *side-fly*, from it's running sideways like a crab. It creeps under the tails, and about the groins, of horses, which, at their first coming out of the north, are rendered half frantic by the tickling sensation; while our own breed little regards them.

The curious *Réaumur* [7] discovered the large eggs, or rather *pupæ*, of these flies as big as the flies themselves, which he hatched in his own bosom. Any person that will take the trouble to examine

* See *Ulloa's* Travels.

the old nests of either species of swallows may find in them the black shining cases or skins of the *pupæ* of these insects: but for other particulars, too long for this place, we refer the reader to *l'Histoire d'Insectes* of that admirable entomologist. Tom. iv. pl. 11.

[1] The barn owl does sometimes hoot; a modern observer describes the sound as "a short too-ee, and a long moaning ooo-ooo-ooo, quite distinct from the tu-whit of the tawny or the musical hoot of that bird."

[2] Or more probably that they may be enabled to hear perfectly themselves.

[3] Birds of prey are capable of taking in all the liquid they need in the form of blood.

[4] Guayaquil, on the Pacific coast of South America, formerly in Peru, but now the largest town in the Republic of Ecuador.

[5] Stenopteryx hirundinis (L.).

[6] Hippobosca equina (L.).

[7] René-Antoine Ferchault, Sieur de Réaumur (1683–1757) was a French scientist, and inventor of a thermometer scale named after him, but now rarely used. Although here mentioned as an entomologist, he cast his net wide, investigating also the best means of collecting gold dust from French rivers, how to keep eggs fresh, the art of hatching chickens by the Egyptian method, the marine flea, the cause of numbness of the torpedo, the turning of iron into steel, and the methods by which birds build their nests.

LETTER XVI

TO THE SAME

Selborne, *Nov.* 30, 1773.

Dear Sir,

In obedience to your injunctions I sit down to give you some account of the house-martin, or martlet; and, if my monography of this little domestic and familiar bird should happen to meet with your approbation, I may probably soon extend my enquiries to the rest of the *British hirundines*—the swallow, the swift, and the bank-martin.

A few house-martins begin to appear about the sixteenth of *April*; usually some few days later than the swallow. For some time after they appear the hirundines in general pay no attention to the business of nidification, but play and sport about, either to

recruit from the fatigue of their journey, if they do migrate at all, or else that their blood may recover it's true tone and texture after it has been so long benumbed by the severities of winter. About the middle of *May*, if the weather be fine, the martin begins to think in earnest of providing a mansion for it's family. The crust or shell of this nest seems to be formed of such dirt or loam as comes most readily to hand, and is tempered and wrought together with little bits of broken straws to render it tough and tenacious. As this bird often builds against a perpendicular wall without any projecting ledge under, it requires it's utmost efforts to get the first foundation firmly fixed, so that it may safely carry the superstructure. On this occasion the bird not only clings with it's claws, but partly supports itself by strongly inclining it's tail against the wall, making that a fulcrum; and thus steadied it works and plasters the materials into the face of the brick or stone. But then, that this work may not while it is soft and green, pull itself down by it's own weight, the provident architect has prudence and forbearance enough not to advance her work too fast [1]; but by building only in the morning, and by dedicating the rest of the day to food and amusement, gives it sufficient time to dry and harden. About half an inch seems to be a sufficient layer for a day. Thus careful workmen when they build mud-walls (informed at first perhaps by this little bird) raise but a moderate layer at a time, and then desist; lest the work should become top-heavy, and so be ruined by it's own weight. By this method in about ten or twelve days is formed an hemispheric nest with a small aperture towards the top, strong, compact, and warm; and perfectly fitted for all the purposes for which it was intended. But then nothing is more common than for the house-sparrow, as soon as the shell is finished, to seize on it as it's own, to eject the owner, and to line it after it's own manner.

After so much labour is bestowed in erecting a mansion, as Nature seldom works in vain, martins will breed on for several years together in the same nest, where it happens to be well sheltered and secure from the injuries of weather. The shell or crust of the nest

is a sort of rustic-work full of knobs and protuberances on the outside: nor is the inside of those that I have examined smoothed with any exactness at all; but is rendered soft and warm, and fit for incubation, by a lining of small straws, grasses, and feathers; and sometimes by a bed of moss interwoven with wool. In this nest they tread, or engender, frequently during the time of building; and the hen lays from three to five white eggs.

At first when the young are hatched, and are in a naked and helpless condition, the parent birds, with tender assiduity, carry out what comes away from their young. Was it not for this affectionate cleanliness the nestlings would soon be burnt up, and destroyed in so deep and hollow a nest, by their own caustic excrement. In the quadruped creation the same neat precaution is made use of; particularly among dogs and cats, where the dams lick away what proceeds from their young. But in birds there seems to be a particular provision, that the dung of nestlings is enveloped into a tough kind of jelly, and therefore is the easier conveyed off without soiling or daubing. Yet, as nature is cleanly in all her ways, the young perform this office for themselves in a little time by thrusting their tails out at the aperture of their nest. As the young of small birds presently arrive at their ἡλικία, or full growth, they soon become impatient of confinement, and sit all day with their heads out at the orifice, where the dams, by clinging to the nests, supply them with food from morning to night. For a time the young are fed on the wing by their parents; but the feat is done by so quick and almost imperceptible a slight, that a person must have attended very exactly to their motions before he would be able to perceive it. As soon as the young are able to shift for themselves, the dams immediately turn their thoughts to the business of a second brood: while the first flight, shaken off and rejected by their nurses, congregate in great flocks, and are the birds that are seen clustering and hovering on sunny mornings and evenings round towers and steeples, and on the roofs of churches and houses. These congregatings usually begin to take place about the first week in *August*; and therefore we

may conclude that by that time the first flight is pretty well over. The young of this species do not quit their abodes all together; but the more forward birds get abroad some days before the rest. These approaching the eaves of buildings, and playing about before them, make people think that several old ones attend one nest.[2] They are often capricious in fixing on a nesting-place, beginning many edifices, and leaving them unfinished; but when once a nest is completed in a sheltered place, it serves for several seasons. Those which breed in a ready finished house get the start in hatching of those that build new by ten days or a fortnight. These industrious artificers are at their labours in the long days before four in the morning: when they fix their materials they plaster them on with their chins, moving their heads with a quick vibratory motion. They dip and wash as they fly sometimes in very hot weather, but not so frequently as swallows. It has been observed that martins usually build to a north-east or north-west aspect,[3] that the heat of the sun may not crack and destroy their nests: but instances are also remembered where they bred for many years in vast abundance in an hot stifled inn-yard, against a wall facing to the south.

Birds in general are wise in their choice of situation: but in this neighbourhood every summer is seen a strong proof to the contrary at an house without eaves in an exposed district, where some martins build year by year in the corners of the windows. But, as the corners of these windows (which face to the south-east and south-west) are too shallow, the nests are washed down every hard rain; and yet these birds drudge on to no purpose from summer to summer, without changing their aspect or house. It is a piteous sight to see them labouring when half their nest is washed away and bringing dirt . . . "*generis lapsi sarcire ruinas*". Thus is instinct a most wonderful unequal faculty; in some instances so much above reason, in other respects so far below it! Martins love to frequent towns,[4] especially if there are great lakes and rivers at hand; nay they even affect the close air of *London*. And I have not only seen them nesting in the *Borough*, but in even the *Strand*

and *Fleet-street*; but then it was obvious from the dinginess of their aspect that their feathers partook of the filth of that sooty atmosphere. Martins are by far the least agile of the four species; their wings and tails are short, and therefore they are not capable of such surprising turns and quick and glancing evolutions as the swallow. Accordingly they make use of a placid easy motion in a middle region of the air, seldom mounting to any great height, and never sweeping long together over the surface of the ground or water. They do not wander far for food, but affect sheltered districts, over some lake, or under some hanging wood, or in some hollow vale, especially in windy weather. They breed the latest of all the swallow kinds [5]: in 1772 they had nestlings on to *October* the twenty-first, and are never without unfledged young as late as *Michaelmas*.

As the summer declines the congregating flocks increase in numbers daily by the constant accession of the second broods: till at last they swarm in myriads upon myriads round the villages on the *Thames*, darkening the face of the sky as they frequent the aits of that river, where they roost. They retire, the bulk of them I mean, in vast flocks together about the beginning of *October*: but have appeared of late years in a considerable flight in this neighbourhood, for one day or two, as late as *November* the third and sixth, after they were supposed to have been gone for more than a fortnight. They therefore withdraw with us the latest of any species. Unless these birds are very short-lived indeed, or unless they do not return to the district where they are bred,[6] they must undergo vast devastations some how, and some where; for the birds that return yearly bear no manner of proportion to the birds that retire.

House-martins are distinguished from their congeners by having their legs covered with soft downy feathers down to their toes. They are no songsters; but twitter in a pretty inward soft manner in their nests. During the time of breeding they are often greatly molested with fleas.

I am, &c.

[1] But the nest is sometimes practically finished after three days' work, without proving insecure.

[2] These young birds not only approach the nests, but sometimes help to feed the later broods ; in September as many as five birds have been observed bringing food to one nest, and in mid-May Edmund Selous has seen adult birds enter one another's nests repeatedly.

[3] At the present time it is difficult to make out a good case for any one aspect being favoured above the rest.

[4] Industrialism and sanitation have banished martins from most of the larger English towns, inner London included ; at present villages are their chief strongholds.

[5] In 1791 the author found three young martins in the nest at Selborne on October 22nd ; they were fed by old birds until November 1st, " a severe frosty day ", when they disappeared, and one was found dead in a neighbour's garden.

[6] House-martins have been proved by means of ringing to return to the same place and even the same nest year after year ; this is a general, but by no means invariable custom.

LETTER XVII

TO THE SAME

Ringmer, near Lewes, *Dec.* 9, 1773.

DEAR SIR,

I RECEIVED your last favour just as I was setting out for this place ; and am pleased to find that my monography met with your approbation. My remarks are the result of many years observation ; and are, I trust, true in the whole : though I do not pretend to say that they are perfectly void of mistake, or that a more nice observer might not make many additions, since subjects of this kind are inexhaustible.

If you think my letter worthy the notice of your respectable society,[1] you are at liberty to lay it before them ; and they will consider it, I hope, as it was intended, as an humble attempt to promote a more minute inquiry into natural history ; into the life and conversation of animals. Perhaps hereafter I may be induced to take the house-swallow under consideration ; and from that proceed to the rest of the *British hirundines*.

Though I have now travelled the *Sussex-downs* upwards of

thirty years, yet I still investigate that chain of majestic mountains with fresh admiration year by year; and think I see new beauties every time I traverse it. This range, which runs from *Chichester* eastward as far as *East-Bourn*, is about sixty miles in length, and is called *The South Downs*, properly speaking, only round *Lewes*. As you pass along you command a noble view of the wild, or weald, on one hand, and the broad downs and sea on the other. Mr. *Ray* used to visit a family* just at the foot of these hills, and was so ravished with the prospect from *Plumpton-plain* near *Lewes*, that he mentions those scapes in his "Wisdom of God in the Works of the Creation" with the utmost satisfaction, and thinks them equal to any thing he had seen in the finest parts of *Europe*.

For my own part, I think there is somewhat peculiarly sweet and amusing in the shapely figured aspect of chalk-hills in preference to those of stone, which are rugged, broken, abrupt, and shapeless.

Perhaps I may be singular in my opinion, and not so happy as to convey to you the same idea; but I never contemplate these mountains without thinking I perceive somewhat analogous to growth in their gentle swellings and smooth fungus-like protuberances, their fluted sides, and regular hollows and slopes, that carry at once the air of vegetative dilatation and expansion. . . .

. . . Or was there ever a time when these immense masses of calcarious matter were thrown into fermentation by some adventitious moisture; were raised and leavened into such shapes by some plastic power; and so made to swell and heave their broad backs into the sky so much above the less animated clay of the wild below? [2]

By what I can guess from the admeasurements of the hills that have been taken round my house, I should suppose that these hills surmount the wild at an average at about the rate of five hundred feet.

One thing is very remarkable as to the sheep: from the westward till you get to the river *Adur* all the flocks have horns, and

* Mr. *Courthope* of *Danny*.

smooth white faces, and white legs; and a hornless sheep is rarely to be seen: but as soon as you pass that river eastward, and mount *Beeding-hill*, all the flocks at once become hornless, or, as they call them, poll-sheep; and have moreover black faces with a white tuft of wool on their foreheads, and speckled and spotted legs: so that you would think that the flocks of *Laban* were pasturing on one side of the stream, and the variegated breed of his son-in-law *Jacob* were cantoned along on the other. And this diversity holds good respectively on each side from the valley of *Bramber* and *Beeding* to the eastward, and westward all the whole length of the downs. If you talk with the shepherds on this subject, they tell you that the case has been so from time immemorial: and smile at your simplicity if you ask them whether the situation of these two different breeds might not be reversed? However, an intelligent friend of mine near *Chichester* is determined to try the experiment; and has this autumn, at the hazard of being laughed at, introduced a parcel of black-faced hornless rams among his horned western ewes. The black-faced poll-sheep have the shortest legs and the finest wool.

As I had hardly ever before travelled these downs at so late a season of the year, I was determined to keep as sharp a lookout as possible so near the southern coast, with respect to the summer short-winged birds of passage. We make great inquiries concerning the withdrawing of the swallow kind, without examining enough into the causes why *this tribe* is never to be seen in winter: for, *entre nous*, the disappearing of the latter is more marvellous than that of the former, and much more unaccountable. The *hirundines*, if they please, are certainly capable of migration; and yet no doubt are often found in a torpid state: but redstarts, nightingales, white-throats, black-caps, &c., &c., are very ill provided for long flights; have never been once found, as I ever heard of, in a torpid state, and yet can never be supposed, in such troops, from year to year to dodge and elude the eyes of the curious and inquisitive, which from day to day discern the other small birds that are known to abide our winters. But, notwithstanding all my care, I saw nothing

like a summer bird of passage: and, what is more strange, not one wheat-ear, though they abound so in the autumn as to be a considerable perquisite to the shepherds that take them; and though many are to be seen to my knowledge all the winter through in many parts of the south of *England*. The most intelligent shepherds tell me that some few of these birds appear on the downs in *March*, and then withdraw to breed probably in warrens and stone-quarries: now and then a nest is plowed up in a fallow on the downs under a furrow, but it is thought a rarity. At the time of wheat-harvest they begin to be taken in great numbers; are sent for sale in vast quantities to *Brighthelmstone* and *Tunbridge*; and appear at the tables of all the gentry that entertain with any degree of elegance. About *Michaelmas* they retire and are seen no more till *March*. Though these birds are, when in season, in great plenty on the south downs round *Lewes*, yet at *East-Bourn*, which is the eastern extremity of those downs, they abound much more. One thing is very remarkable—that though in the height of the season so many hundreds of dozens are taken, yet they never are seen to flock; and it is a rare thing to see more than three or four at a time: so that there must be a perpetual flitting and constant progressive succession. It does not appear that any wheat-ears are taken to the westward of *Houghton-bridge*, which stands on the river *Arun*.

I did not fail to look particularly after my new migration of *ring-ousels*; and to take notice whether they continued on the downs to this season of the year; as I had formerly remarked them in the month of *October* all the way from *Chichester* to *Lewes* wherever there were any shrubs and covert: but not one bird of this sort came within my observation. I only saw a few *larks*, and *whin-chats*, some *rooks*, and several *kites* and *buzzards*.[3]

About *Midsummer* a flight of *cross-bills* comes to the pine-groves about this house, but never makes any long stay.

The old tortoise, that I have mentioned in a former letter, still continues in this garden; and retired under ground about the twentieth of *November*, and came out again for one day on the

thirtieth: it lies now buried in a wet swampy border under a wall facing to the south, and is enveloped at present in mud and mire!

Here is a large rookery round this house, the inhabitants of which seem to get their livelihood very easily; for they spend the greatest part of the day on their nest-trees when the weather is mild. These rooks retire every evening all the winter from this rookery, where they only call by the way, as they are going to roost in deep woods: at the dawn of day they always revisit their nest-trees, and are preceded a few minutes by a flight of daws, that act, as it were, as their harbingers.

I am, &c.

[1] The Royal Society, before which the foregoing letter was read on 10th February, 1774.

[2] The North and South Downs are supposed to have once formed part of a single vast layer of chalk, the centre of which has gradually been eaten away by denudation, leaving the long parallel ridges divided by over twenty miles of low-lying wealden clay. This explains how both ranges of Downs are pierced by the valleys of rivers, which could never have penetrated them unless the central tract had originally been higher. The main ridge of the South Downs is from four to seven hundred feet above the Weald.

[3] The absence of summer migrants was clearly due to the late date at which the journey was made. The supposed whinchats were almost undoubtedly stonechats which (except for the adult males) are superficially similar, and remain through the winter. Kites and buzzards were still fairly common on the Downs at this period, and the author has a note of seeing "16 fork-tailed kites at once" on November 13th, 1771. The kite has long ceased to breed in England, though a few pairs linger in Wales; the buzzard remains common only in the west. Crossbills are local, spasmodic and generally scarce nesting birds south of the Scottish Highlands, which are inhabited by a peculiar race. They breed early, and shift quarters in small flocks about June or July.

LETTER XVIII

TO THE SAME

Selborne, *Jan.* 29, 1774.

Dear Sir,

The house-swallow, or chimney-swallow, is undoubtedly the first comer of all the *British hirundines* [1]; and appears in general on or

about the thirteenth of *April*, as I have remarked from many years observation. Not but now and then a straggler is seen much earlier: and, in particular, when I was a boy I observed a swallow for a whole day together on a sunny warm *Shrove Tuesday*; which day could not fall out later than the middle of *March*, and often happened early in *February*.[2]

It is worth remarking that these birds are seen first about lakes and mill-ponds; and it is also very particular, that if these early visitors happen to find frost and snow, as was the case of the two dreadful springs of 1770 and 1771, they immediately withdraw for a time. A circumstance this much more in favour of hiding than migration; since it is much more probable that a bird should retire to it's hybernaculum just at hand, than return for a week or two only to warmer latitudes.

The swallow, though called the chimney-swallow, by no means builds altogether in chimnies, but often within barns and outhouses against the rafters; and so she did in *Virgil's* time:

"— — — — Antè
"Garrula quàm tignis nidos suspendat hirundo."

In *Sweden* she builds in barns, and is called *ladu swala*, the barn-swallow. Besides, in the warmer parts of *Europe* there are no chimnies to houses, except they are *English-built*: in these countries she constructs her nest in porches, and gate-ways, and galleries, and open halls.

Here and there a bird may affect some odd, peculiar place; as we have known a swallow build down the shaft of an old well, through which chalk had been formerly drawn up for the purpose of manure: but in general with us this *hirundo* breeds in chimnies,[3] and loves to haunt those stacks where there is a constant fire, no doubt for the sake of warmth. Not that it can subsist in the immediate shaft where there is a fire; but prefers one adjoining to that of the kitchen, and disregards the perpetual smoke of that funnel, as I have often observed with some degree of wonder.

Five or six or more feet down the chimney does this little bird begin to form her nest about the middle of *May*, which consists, like that of the house-martin, of a crust or shell composed of dirt or mud, mixed with short pieces of straw to render it tough and permanent; with this difference, that whereas the shell of the martin is nearly hemispheric, that of the swallow is open at the top, and like half a deep dish: this nest is lined with fine grasses, and feathers which are often collected as they float in the air.

Wonderful is the address which this adroit bird shews all day long in ascending and descending with security through so narrow a pass. When hovering over the mouth of the funnel, the vibrations of her wings acting on the confined air occasion a rumbling like thunder. It is not improbable that the dam submits to this inconvenient situation so low in the shaft, in order to secure her broods from rapacious birds, and particularly from owls, which frequently fall down chimnies, perhaps in attempting to get at these nestlings.

The swallow lays from four to six white eggs, dotted with red specks; and brings out her first brood about the last week in *June*, or the first week in *July*. The progressive method by which the young are introduced into life is very amusing: first, they emerge from the shaft with difficulty enough, and often fall down into the rooms below: for a day or so they are fed on the chimney-top, and then are conducted to the dead leafless bough of some tree, where, sitting in a row, they are attended with great assiduity, and may then be called *perchers*. In a day or two more they become *flyers*, but are still unable to take their own food; therefore they play about near the place where the dams are hawking for flies; and, when a mouthful is collected, at a certain signal given, the dam and the nestling advance, rising towards each other, and meeting at an angle; the young one all the while uttering such a little quick note of gratitude and complacency, that a person must have paid very little regard to the wonders of Nature that has not often remarked this feat.

The dam betakes herself immediately to the business of a second brood as soon as she is disengaged from her first; which at once associates with the first broods of *house-martins*; and with them congregates, clustering on sunny roofs, towers, and trees. This hirundo brings out her second brood towards the middle and end of *August*.

All the summer long is the swallow a most instructive pattern of unwearied industry and affection; for, from morning to night, while there is a family to be supported, she spends the whole day in skimming close to the ground, and exerting the most sudden turns and quick evolutions. Avenues, and long walks under hedges, and pasture-fields, and mown meadows where cattle graze, are her delight, especially if there are trees interspersed; because in such spots insects most abound. When a fly is taken a smart snap from her bill is heard, resembling the noise at the shutting of a watch-case; but the motion of the mandibles are too quick for the eye.

The swallow, probably the male bird, is the *excubitor* to house-martins, and other little birds, announcing the approach of birds of prey. For as soon as an hawk appears, with a shrill alarming note he calls all the swallows and martins about him; who pursue in a body, and buffet and strike their enemy till they have driven him from the village, darting down from above on his back, and rising in a perpendicular line in perfect security. This bird also will sound the alarm, and strike at cats when they climb on the roofs of houses, or otherwise approach the nests. Each species of hirundo drinks as it flies along, sipping the surface of the water; but the swallow alone, in general, *washes* on the wing, by dropping into a pool for many times together: in very hot weather house-martins and bank-martins dip and wash a little.

The swallow is a delicate songster, and in soft sunny weather sings both perching and flying; on trees in a kind of concert, and on chimney tops: is also a bold flyer, ranging to distant downs and commons even in windy weather, which the other species seem much to dislike; nay, even frequenting exposed sea-port towns,

and making little excursions over the salt water. Horsemen on wide downs are often closely attended by a little party of swallows for miles together, which plays before and behind them, sweeping around, and collecting all the sculking insects that are roused by the trampling of the horses' feet: when the wind blows hard, without this expedient, they are often forced to settle to pick up their lurking prey.

This species feeds much on little *coleoptera*, as well as on gnats and flies; and often settles on dug ground, or paths, for gravels to grind and digest it's food. Before they depart, for some weeks, to a bird, they forsake houses and chimnies, and roost in trees; and usually withdraw about the beginning of *October*; though some few stragglers may appear on at times till the first week in *November*.[4]

Some few pairs haunt the new and open streets of *London* next the fields, but do not enter, like the house-martin, the close and crowded parts of the city.

Both male and female are distinguished from their congeners by the length and forkedness of their tails. They are undoubtedly the most nimble of all the species: and when the male pursues the female in amorous chase, they then go beyond their usual speed, and exert a rapidity almost too quick for the eye to follow.

After this circumstantial detail of the life and discerning στοργη of the swallow, I shall add, for your farther amusement, an anecdote or two not much in favour of her sagacity:—

A certain swallow built for two years together on the handles of a pair of garden-shears, that were stuck up against the boards in an out-house, and therefore must have her nest spoiled whenever that implement was wanted: and, what is stranger still, another bird of the same species built it's nest on the wings and body of an owl that happened by accident to hang dead and dry from the rafter of a barn. This owl, with the nest on it's wings, and with eggs in the nest, was brought as a curiosity worthy the most elegant private museum in *Great-Britain*. The owner, struck with the

oddity of the sight, furnished the bringer with a large shell, or conch, desiring him to fix it just where the owl hung: the person did as he was ordered, and the following year a pair, probably the same pair, built their nest in the conch, and laid their eggs.

The owl and the conch make a strange grotesque appearance, and are not the least curious specimens in that wonderful collection of art and nature.*

Thus is instinct in animals, taken the least out of it's way, an undistinguishing, limited faculty; and blind to every circumstance that does not immediately respect self-preservation, or lead at once to the propagation or support of their species.

I am,
With all respect, &c. &c.

[1] The mass of data gathered and digested by the various migration inquiries indicates that the vanguard reaches south-west England in the first few days of April, Ireland by the end of the first week, and south-east England (including Selborne) early in the second week, the Orkneys not being colonised before May. A few pioneers are generally seen in March, but at the present time the sand-martin is considered the earliest comer of the group, and the swallow second. The author has a note (21st March, 1790): "I have often suspected that S. Martins are the most early among the hirundines."

[2] But this apparently does not take into account the alteration of the calendar by the omission of 11 days in 1752, about twenty years after the observation must have been made. The real date, therefore, could not possibly have been earlier than 15th February by modern reckoning, which the author was now using, and it might have been as late as 21st March, no extraordinary date for an isolated pioneer to be seen in the south of England.

[3] A complete change has taken place since; breeding in chimneys is now rare in this country, barns, porches and outhouses supplying the usual sites for the nest.

Parson Woodforde has a note under December 24th, 1784: "To my Chimney Sweeper's Son Tom Holland for taking down a couple of Swallows Nests in the Chamber Chimnies gave 0.0.6."

[4] They not infrequently stay later still, and have been satisfactorily recorded every month in the year, exceptionally surviving a very mild winter in England.

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* Sir *Ashton Lever's* Musæum.

LETTER XIX

TO THE SAME

Selborne, *Feb.* 14, 1774.

DEAR SIR,

I RECEIVED your favour of the eighth, and am pleased to find that you read my little history of the swallow with your usual candour: nor was I the less pleased to find that you made objections where you saw reason.

As to the quotations, it is difficult to say precisely which species of hirundo *Virgil* might intend in the lines in question, since the ancients did not attend to specific differences like modern naturalists: yet somewhat may be gathered, enough to incline me to suppose that in the two passages quoted the poet had his eye on the swallow.

In the first place the epithet *garrula* suits the *swallow* well, who is a great songster; and not the *martin*, which is rather a mute bird; and when it sings is so inward as scarce to be heard. Besides, if *tignum* in that place signifies a *rafter* rather than a *beam*, as it seems to me to do, then I think it must be the *swallow* that is alluded to, and not the *martin*; since the former does frequently build *within the roof* against the *rafters*; while the latter always, as far as I have been able to observe, builds *without the roof* against eaves and cornices.

As to the *simile*, too much stress must not be laid on it: yet the epithet *nigra* speaks plainly in favour of the swallow, whose back and wings are very black; while the rump of the martin is milk-white, it's back and wings blue, and all it's under part white as snow. Nor can the clumsy motions (comparatively clumsy) of the martin well represent the sudden and artful evolutions and quick turns which *Juturna* gave to her brother's chariot, so as to elude the eager pursuit of the enraged *Æneas*. The verb *sonat* also seems to imply a bird that is somewhat loquacious.*

* "*Nigra* velut magnas domini cum divitis ædes
"Pervolat, et pennis alta atria lustrat hirundo,
"Pabula parva legens, nidisque loquacibus escas:
"Et nunc porticibus vacuis, nunc humida circum
"Stagna *sonat*."

We have had a very wet autumn and winter, so as to raise the springs to a pitch beyond any thing since 1764; which was a remarkable year for floods and high waters. The land-springs, which we call *lavants*, break out much on the downs of *Sussex*, *Hampshire*, and *Wiltshire*. The country people say when the *lavants* rise corn will always be dear; meaning that when the earth is so glutted with water as to send forth springs on the downs and uplands, that the corn-vales must be drowned: and so it has proved for these ten or eleven years past. For land-springs have never obtained more since the memory of man than during that period; nor has there been known a greater scarcity of all sorts of grain, considering the great improvements of modern husbandry. Such a run of wet seasons a century or two ago would, I am persuaded, have occasioned a famine. Therefore pamphlets and newspaper letters, that talk of combinations, tend to inflame and mislead; since we must not expect plenty till Providence sends us more favourable seasons.

The wheat of last year, all round this district, and in the county of *Rutland*, and elsewhere, yields remarkably bad: and our wheat on the ground, by the continual late sudden vicissitudes from fierce frosts to pouring rains, looks poorly; and the turnips rot very fast.

I am, &c.

LETTER XX

TO THE SAME

Selborne, *Feb.* 26, 1774.

Dear Sir,

The sand-martin, or bank-martin, is by much the least of any of the *British hirundines*; and, as far as we have ever seen, the smallest known hirundo: though *Brisson* asserts that there is one much smaller, and that is the *hirundo esculenta*.[1]

But it is much to be regretted that it is scarce possible for any observer to be so full and exact as he could wish in reciting the circumstances attending the life and conversation of this little bird,

since it is *fera naturâ*, at least in this part of the kingdom, disclaiming all domestic attachments, and haunting wild heaths and commons where there are large lakes: while the other species, especially the swallow and house-martin, are remarkably gentle and domesticated, and never seem to think themselves safe but under the protection of man.

Here are in this parish, in the sand-pits and banks of the lakes of *Wolmer-forest*, several colonies of these birds; and yet they are never seen in the village; nor do they at all frequent the cottages that are scattered about in that wild district.[2] The only instance I ever remember where this species haunts any building is at the town of *Bishop's Waltham*, in this county, where many sand-martins nestle and breed in the scaffold-holes of the back-wall of *William* of *Wykeham's* stables: but then this wall stands in a very sequestered and retired enclosure, and faces upon a large and beautiful lake. And indeed this species seems so to delight in large waters, that no instance occurs of their abounding, but near vast pools or rivers: and in particular it has been remarked that they swarm in the banks of the *Thames* in some places below *London-bridge*.

It is curious to observe with what different degrees of architectonic skill Providence has endowed birds of the same genus, and so nearly correspondent in their general mode of life! for while the swallow and the house-martin discover the greatest address in raising and securely fixing crusts or shells of loam as cunabula for their young, the bank-martin terebrates a round and regular hole in the sand or earth, which is serpentine, horizontal, and about two feet deep. At the inner end of this burrow does this bird deposit, in a good degree of safety, her rude nest, consisting of fine grasses and feathers, usually goose-feathers, very inartificially laid together.

Perseverance will accomplish anything: though at first one would be disinclined to believe that this weak bird, with her soft and tender bill and claws, should ever be able to bore the stubborn sand-bank without entirely disabling herself: yet with these feeble instruments have I seen a pair of them make great dispatch: and

could remark how much they had scooped that day by the fresh sand which ran down the bank, and was of a different colour from that which lay loose and bleached in the sun.

In what space of time these little artists are able to mine and finish these cavities I have never been able to discover, for reasons given above; but it would be a matter worthy of observation, where it falls in the way of any naturalist to make his remarks.[3] This I have often taken notice of, that several holes of different depths are left unfinished at the end of summer. To imagine that these beginnings were intentionally made in order to be in the greater forwardness for next spring, is allowing perhaps too much foresight and *rerum prudentia* to a simple bird. May not the cause of these *latebræ* being left unfinished arise from their meeting in those places with strata too harsh, hard, and solid, for their purpose, which they relinquish, and go to a fresh spot that works more freely? Or may they not in other places fall in with a soil as much too loose and mouldering, liable to flounder, and threatening to overwhelm them and their labours?

One thing is remarkable—that, after some years, the old holes are forsaken and new ones bored; perhaps because the old habitations grow foul and fetid from long use, or because they may so abound with fleas as to become untenantable. This species of swallow moreover is strangely annoyed with fleas: and we have seen fleas, bed-fleas[4] (*pulex irritans*), swarming at the mouths of these holes, like bees on the stools of their hives.

The following circumstance should by no means be omitted—that these birds do *not* make use of their caverns by way of hybernacula, as might be expected; since banks so perforated have been dug out with care in the winter, when nothing was found but empty nests.

The sand-martin arrives much about the same time with the swallow, and lays, as she does, from four to six white eggs. But as this species is *cryptogame*, carrying on the business of nidification, incubation, and the support of it's young in the dark, it would not be so easy to ascertain the time of breeding, were it not for the

coming forth of the broods, which appear much about the time, or rather somewhat earlier than those of the swallow. The nestlings are supported in common like those of their congeners, with gnats and other small insects; and sometimes they are fed with *libellulæ* (dragon-flies) almost as long as themselves. In the last week in *June* we have seen a row of these sitting on a rail near a great pool as *perchers*; and so young and helpless, as easily to be taken by hand: but whether the dams ever feed them on the wing, as swallows and house-martins do, we have never yet been able to determine; nor do we know whether they pursue and attack birds of prey.[5]

When they happen to breed near hedges and enclosures, they are dispossessed of their breeding holes by the house-sparrow,[6] which is on the same account a fell adversary to house-martins.

These *hirundines* are no songsters, but rather mute, making only a little harsh noise when a person approaches their nests. They seem not to be of a sociable turn, never with us congregating with their congeners in the autumn. Undoubtedly they breed a second time, like the house-martin and swallow; and withdraw about *Michaelmas*.

Though in some particular districts they may happen to abound, yet in the whole, in the south of *England* at least, is this much the rarest species. For there are few towns or large villages but what abound with house-martins; few churches, towers, or steeples, but what are haunted by some swifts; scarce a hamlet or single cottage-chimney that has not its swallow; while the bank-martins, scattered here and there, live a sequestered life among some abrupt sand-hills, and in the banks of some few rivers.

These birds have a peculiar manner of flying; flitting about with odd jerks, and vacillations, not unlike the motions of a butterfly. Doubtless the flight of all *hirundines* is influenced by, and adapted to, the peculiar sort of insects which furnish their food. Hence it would be worth inquiry to examine what particular genus of insects affords the principal food of each respective species of swallow.

Notwithstanding what has been advanced above, some few

sand-martins, I see, haunt the skirts of *London*, frequenting the dirty pools in *Saint George's-Fields*,[7] and about *White-Chapel*. The question is where these build, since there are no banks or bold shores in that neighbourhood: perhaps they nestle in the scaffold holes of some old or new deserted building. They dip and wash as they fly sometimes, like the house-martin and swallow.

Sand-martins differ from their congeners in the diminutiveness of their size, and in their colour, which is what is usually called a mouse-colour. Near *Valencia*, in *Spain*, they are taken, says *Willughby*, and sold in the markets for the table; and are called by the country people, probably from their desultory jerking manner of flight, *Papilion de Montagna*.

[1] The edible swift.

[2] There are at the present time several colonies in Wolmer Forest with neighbouring houses, as at Shortheath and near Greatham; the Whitehill colony in Selborne parish is in a sandpit actually surrounded by houses. But in all these cases the buildings are modern, and the sand-martins were probably the first comers. They breed freely at a distance from water.

[3] A twenty-inch tunnel has been known to be excavated within forty-eight hours, and a four-foot tunnel within sixteen days, but further observations are still desirable.

[4] Not bed-fleas, but a species now placed in a different genus, *Geratophyllus styx* (Roths.).

[5] Sand-martins feed their young on the wing freely; and a whole colony will turn out to mob and harass any of the smaller birds of prey that approach.

[6] Sometimes also by the tree-sparrow or the starling.

[7] At this period a large open district south of the river, between Blackfriars and Westminster Bridges; it was the scene of many riots, but has long since been built up, with Bethlehem Hospital and its neighbourhood standing on the site.

LETTER XXI

TO THE SAME

Selborne, *Sept.* 28, 1774.

DEAR SIR,

As the *swift* or *black-martin* is the largest of the *British hirundines*, so is it undoubtedly the latest comer. For I remember but one instance of it's appearing before the last week in *April*: and in some

of our late frosty, harsh springs, it has not been seen till the beginning of *May*. This species usually arrives in pairs.

The swift, like the sand-martin, is very defective in architecture, making no crust, or shell, for it's nest; but forming it of dry grasses and feathers, very rudely and inartificially put together. With all my attention to these birds, I have never been able once to discover one in the act of collecting or carrying in materials: so that I have suspected (since their nests are exactly the same) that they sometimes usurp upon the house-sparrows, and expel them, as sparrows do the house and sand-martin; well remembering that I have seen them squabbling together at the entrance of their holes; and the sparrows up in arms, and much disconcerted at these intruders. And yet I am assured, by a nice observer in such matters, that they do collect feathers for their nests in *Andalusia*; and that he has shot them with such materials in their mouths.[1]

Swifts, like sand-martins, carry on the business of nidification quite in the dark, in crannies of castles, and towers, and steeples, and upon the tops of the walls of churches under the roof; and therefore cannot be so narrowly watched as those species that build more openly: but, from what I could ever observe, they begin nesting about the middle of *May*; and I have remarked, from eggs taken, that they have sat hard by the ninth of *June*. In general they haunt tall buildings, churches, and steeples, and breed only in such: yet in this village some pairs frequent the lowest and meanest cottages, and educate their young under those thatched roofs. We remember but one instance where they breed out of buildings; and that is in the sides of a deep chalkpit near the town of *Odiham*, in this county, where we have seen many pairs entering the crevices, and skimming and squeaking round the precipices.

As I have regarded these amusive birds with no small attention, if I should advance something new and peculiar with respect to them, and different from all other birds, I might perhaps be credited; especially as my assertion is the result of many years exact observation. The fact that I would advance is, that swifts *tread*, or copulate, on

the wing: and I would wish any nice observer, that is startled at this supposition, to use his own eyes, and I think he will soon be convinced. In another *class* of animals, *viz.* the *insect*, nothing is so common as to see the different species of many genera in conjunction as they fly. The swift is almost continually on the wing; and as it never settles on the ground, on trees, or roofs, would seldom find opportunity for amorous rites, was it not enabled to indulge them in the air. If any person would watch these birds of a fine morning in *May*, as they are sailing round at a great height from the ground, he would see, every now and then, one drop on the back of another, and both of them sink down together for many fathoms with a loud piercing shriek. This I take to be the juncture when the business of generation is carrying on.

As the swift eats, drinks, collects materials for it's nest, and, as it seems, propagates on the wing; it appears to live more in the air than any other bird, and to perform all functions there save those of sleeping and incubation.

This *hirundo* differs widely from it's congeners in laying invariably but *two* eggs at a time,[2] which are milk-white, long, and peaked at the small end; whereas the other species lay at each brood from *four* to *six*. It is a most alert bird, rising very early, and retiring to roost very late; and is on the wing in the height of summer at least sixteen hours. In the longest days it does not withdraw to rest till a quarter before nine in the evening, being the latest of all day birds. Just before they retire whole groups of them assemble high in the air, and squeak, and shoot about with wonderful rapidity. But this bird is never so much alive as in sultry thundry weather, when it expresses great alacrity, and calls forth all it's powers. In hot mornings several, getting together in little parties, dash round the steeples and churches, squeaking as they go in a very clamorous manner: these, by nice observers, are supposed to be males, serenading their sitting hens; and not without reason, since they seldom squeak till they come close to the walls or eaves, and since those within utter at the same time a little inward note of complacency.

When the hen has sat hard all day, she rushes forth just as it is almost dark, and stretches and relieves her weary limbs, and snatches a scanty meal for a few minutes, and then returns to her duty of incubation. Swifts, when wantonly and cruelly shot while they have young, discover a little lump of insects in their mouths, which they pouch and hold under their tongue. In general they feed in a much higher district than the other species; a proof that gnats and other insects do also abound to a considerable height in the air: they also range to vast distances; since loco-motion is no labour to them, who are endowed with such wonderful powers of wing. Their powers seem to be in proportion to their leavers; and their wings are longer in proportion than those of almost any other bird. When they mute, or ease themselves in flight, they raise their wings, and make them meet over their backs.

At some certain times in the summer I had remarked that swifts were hawking very low for hours together over pools and streams; and could not help inquiring into the object of their pursuit that induced them to descend so much below their usual range. After some trouble, I found that they were taking *phryganeæ*, *ephemeræ*, and *libellulæ* (cadew flies, may-flies, and dragon-flies) that were just emerged out of their aurelia state. I then no longer wondered that they should be so willing to stoop for a prey that afforded them such plentiful and succulent nourishment.

They bring out their young about the middle or latter end of *July*: but as these never become perchers, nor, that ever I could discern, are fed on the wing by their dams, the coming forth of the young is not so notorious as in the other species.

On the thirtieth of last *June* I untiled the eaves of an house where many pairs build, and found in each nest only *two* squab naked *pulli*: on the eighth of *July* I repeated the same inquiry, and found they had made very little progress towards a fledged state, but were still naked and helpless. From whence we may conclude that birds whose way of life keeps them perpetually on the wing would not be able to quit their nest till the end of the month.

Swallows and martins, that have numerous families, are continually feeding them every two or three minutes; while swifts, that have but two young to maintain, are much at their leisure, and do not attend on their nests for hours together.

Sometimes they pursue and strike at hawks that come in their way; but not with that vehemence and fury that swallows express on the same occasion. They are out all day long in wet days, feeding about, and disregarding still rain: from whence two things may be gathered; first, that many insects abide high in the air, even in rain; and next, that the feathers of these birds must be well preened to resist so much wet. Windy, and particularly windy weather with heavy showers, they dislike; and on such days withdraw, and are scarce ever seen.

There is a circumstance respecting the *colour* of swifts, which seems not to be unworthy our attention. When they arrive in the spring they are all over of a glossy, dark soot-colour, except their chins, which are white; but, by being all day long in the sun and air, they become quite weather-beaten and bleached before they depart, and yet they return glossy again in the spring.[3] Now, if they pursue the sun into lower latitudes, as some suppose, in order to enjoy a perpetual summer, why do they not return bleached? Do they not rather perhaps retire to rest for a season, and at that juncture moult and change their feathers, since all other birds are known to moult soon after the season of breeding?

Swifts are very anomalous in many particulars, dissenting from all their congeners not only in the number of their young, but in breeding but *once* in a summer; whereas all the other *British hirundines* breed invariably *twice*. It is past all doubt that swifts can breed but once, since they withdraw in a short time after the flight of their young, and some time before their congeners bring out their second brood. We may here remark, that, as swifts breed but *once* in a summer, and only *two* at a time, and the other *hirundines twice*, the latter, who lay from four to six eggs, increase at an average five times as fast as the former.

But in nothing are swifts more singular than in their early retreat. They retire, as to the main body of them, by the tenth of *August*, and sometimes a few days sooner: and every straggler invariably withdraws by the twentieth, while their congeners, all of them, stay till the beginning of *October*; many of them all through that month, and some occasionally to the beginning of *November*. This early retreat is mysterious and wonderful, since that time is often the sweetest season in the year. But, what is more extraordinary, they begin to retire still earlier in the most southerly parts of *Andalusia*, where they can be no ways influenced by any defect of heat; or, as one might suppose, defect of food. Are they regulated in their motions with us by a failure of food, or by a propensity to moulting, or by a disposition to rest after so rapid a life, or by what? This is one of those incidents in natural history that not only baffles our searches, but almost eludes our guesses!

These hirundines never perch on trees or roofs, and so never congregate with their congeners. They are fearless while haunting their nesting places, and are not to be scared with a gun; and are often beaten down with poles and cudgels as they stoop to go under the eaves. Swifts are much infested with those pests to the genus called *hippoboscæ hirundinis*; and often wriggle and scratch themselves, in their flight, to get rid of that clinging annoyance.

Swifts are no songsters, and have only one harsh screaming note; yet there are ears to which it is not displeasing, from an agreeable association of ideas, since that note never occurs but in the most lovely summer weather.

They never settle on the ground but through accident; and when down can hardly rise, on account of the shortness of their legs and the length of their wings: neither can they walk, but only crawl; but they have a strong grasp with their feet, by which they cling to walls. Their bodies being flat they can enter a very narrow crevice; and where they cannot pass on their bellies they will turn up edgewise.

The particular formation of the foot discriminates the swift

from all the *British hirundines*; and indeed from all other known birds, the *hirundo melba*, or great white-bellied swift of *Gibraltar*, excepted; for it is so disposed as to carry "*omnes quatuor digitos anticos*" all it's four toes forward; besides the least toe, which should be the back toe, consists of one bone alone, and the other three only of two apiece. A construction most rare and peculiar, but nicely adapted to the purposes in which their feet are employed. This, and some peculiarities attending the nostrils and under mandible, have induced a discerning * naturalist to suppose that this *species* might constitute a *genus per se*.

In *London* a party of swifts frequents the *Tower*, playing and feeding over the river just below the bridge; others haunt some of the churches of the *Borough* next the fields [4]; but do not venture, like the *house-martin*, into the close crowded part of the town.

The *Swedes* have bestowed a very pertinent name on this swallow, calling it *ring swala*, from the perpetual *rings* or circles that it takes round the scene of it's nidification.

Swifts feed on *coleoptera*, or small beetles with hard cases over their wings, as well as on the softer insects; but it does not appear how they can procure gravel to grind their food, as swallows do, since they never settle on the ground. Young ones, over-run with *hippoboscæ*, are sometimes found, under their nests, fallen to the ground: the number of vermin rendering their abode insupportable any longer. They frequent in this village several abject cottages; yet a succession still haunts the same unlikely roofs: a good proof this that the same birds return to the same spots. As they must stoop very low to get up under these humble eaves, cats lie in wait, and sometimes catch them on the wing.

On the fifth of *July*, 1775, I again untiled part of a roof over the nest of a swift. The dam sat in the nest; but so strongly was she affected by natural στοργη for her brood, which she supposed to be in danger, that, regardless of her own safety, she would not stir, but lay sullenly by them, permitting herself to be taken in hand.

* John Antony Scopoli, of Carniola, M.D.

The squab young we brought down and placed on the grass-plot, where they tumbled about, and were as helpless as a new-born child. While we contemplated their naked bodies, their unwieldy disproportioned abdomina, and their heads, too heavy for their necks to support, we could not but wonder when we reflected that these shiftless beings in a little more than a fortnight would be able to dash through the air almost with the inconceivable swiftness of a meteor; and perhaps, in their emigration, must traverse vast continents and oceans as distant as the equator. So soon does Nature advance small birds to their ἡλικια, or state of perfection; while the progressive growth of men and large quadrupeds is slow and tedious!

I am, &c.

[1] The author's brother, the Rev. John White, who made this observation, has proved to be correct; nesting materials are collected on the wing, and glued together with saliva. All the same they do sometimes usurp on house-sparrows, martins, and starlings.

[2] The relationship between the swift and the swallows and martins is extremely distant; it belongs to the distinct order *Cypseli*, the others being *Passeres*, and its closest relative among well-known British forms is the nightjar. Occasionally three eggs are found.

[3] Swifts complete their moult in winter quarters.

[4] The Borough is Southwark, at the Surrey end of London Bridge; St. George's Fields at the rear were not yet built over. At the present time the swift is much more commonly seen over inner London than the swallow or martin, though not actually breeding closer than Hampstead.

LETTER XXII

TO THE SAME

Selborne, *Sept.* 13, 1774.

DEAR SIR,

BY means of a straight cottage-chimney I had an opportunity this summer of remarking, at my leisure, how swallows ascend and descend through the shaft: but my pleasure, in contemplating the address

with which this feat was performed to a considerable depth in the chimney, was somewhat interrupted by apprehensions lest my eyes might undergo the same fate with those of *Tobit*.[1] *

Perhaps it may be some amusement to you to hear at what times the different species of hirundines arrived this spring in three very distant counties of this kingdom. With us the swallow was seen first on *April* the 4th, the swift on *April* the 24th, the bank-martin on *April* the 12th, and the house-martin not till *April* the 30th. At *South Zele, Devonshire*, swallows did not arrive till *April* the 25th; swifts, in plenty, on *May*. the 1st; and house-martins not till the middle of *May*. At *Blackburn*, in *Lancashire*, swifts were seen *April* the 28th, swallows *April* the 29th, house-martins *May* the 1st. Do these different dates, in such distant districts,[2] prove anything for or against migration?

A farmer, near Weyhill,[3] fallows his land with two teams of asses; one of which works till noon, and the other in the afternoon. When these animals have done their work, they are penned all night, like sheep, on the fallow. In the winter they are confined and foddered in a yard, and make plenty of dung.

Linnæus says that hawks "*paciscuntur inducias cum avibus, quamdiu cuculus cuculat*"[4]: but it appears to me that, during that period, many little birds are taken and destroyed by birds of prey, as may be seen by their feathers left in lanes and under hedges.

The *missel-thrush* is, while breeding, fierce and pugnacious, driving such birds as approach it's nest, with great fury, to a distance. The *Welch* call it *pen y llwyn*, the head or master of the coppice. He suffers no magpie, jay, or blackbird, to enter the garden where he haunts; and is, for the time, a good guard to the new-sown legumens. In general he is very successful in the defence of his family: but once I observed in my garden, that several magpies came determined to storm the nest of a missel-thrush: the dams defended their mansion with great vigour, and fought resolutely *pro aris & focis*; but numbers

* Tobit, ii. 10.

at last prevailed, they tore the nest to pieces, and swallowed the young alive.

In the season of nidification the wildest birds are comparatively tame. Thus the *ring-dove* breeds in my fields, though they are continually frequented; and the missel-thrush, though most shy and wild in the autumn and winter, builds in my garden close to a walk where people are passing all day long.

Wall-fruit abounds with me this year; but my grapes, that used to be forward and good, are at present backward beyond all precedent: and this is not the worst of the story; for the same ungenial weather, the same black cold solstice, has injured the more necessary fruits of the earth, and discoloured and blighted our wheat. The crop of hops promises to be very large.

Frequent returns of deafness incommode me sadly, and half disqualify me for a naturalist; for, when those fits are upon me, I lose all the pleasing notices and little intimations arising from rural sounds; and *May* is to me as silent and mute with respect to the notes of birds, &c. as *August*. My eyesight is, thank God, quick and good; but with respect to the other sense, I am, at times, disabled:

"And Wisdom at one entrance quite shut out."

[1] "The same night also I returned from the burial and slept by the wall of my courtyard, being polluted, and my face was uncovered. And I knew not that there were sparrows in the wall, and mine eyes being open, the sparrows muted warm dung into mine eyes, and a whiteness came into mine eyes, and I went to the physicians, but they helped me not."

[2] The author's correspondent at South Zele was Sampson Newbery, Fellow of Exeter College, Oxford, whose father was parson there; the Blackburn dates came from his brother, the Rev. John White, who had returned from Gibraltar in 1772 and been presented to this living by the Archbishop of Canterbury.

[3] A village on the chalk close to Andover and Fyfield, the other side of the county.

[4] Linnæus actually wrote "*cum avibus, imprimis domesticis*": "they make a truce with birds, especially domesticated ones, as long as the cuckoo calls". Naturally birds suffer most heavily in winter, when insects and small mammals offer far fewer alternative victims, and it is well known that birds of prey do not usually hunt in the immediate neighbourhood of their nests, but the number of small birds destroyed during the breeding season is nevertheless considerable.

LETTER XXIII

TO THE SAME

Selborne, *June* 8, 1775.

Dear Sir,

On *September* the 21st, 1741, being then on a visit, and intent on field-diversions, I rose before daybreak: when I came into the enclosures, I found the stubbles and clover-grounds matted all over with a thick coat of cobweb, in the meshes of which a copious and heavy dew hung so plentifully that the whole face of the country seemed, as it were, covered with two or three setting-nets drawn one over another. When the dogs attempted to hunt, their eyes were so blinded and hoodwinked that they could not proceed, but were obliged to lie down and scrape the incumbrances from their faces with their fore-feet, so that, finding my sport interrupted, I returned home musing in my mind on the oddness of the occurrence.

As the morning advanced the sun became bright and warm, and the day turned out one of those most lovely ones which no season but the autumn produces; cloudless, calm, serene, and worthy of the South of *France* itself.

About nine an appearance very unusual began to demand our attention, a shower of cobwebs falling from very elevated regions, and continuing, without any interruption, till the close of the day. These webs were not single filmy threads, floating in the air in all directions, but perfect flakes or rags; some near an inch broad, and five or six long, which fell with a degree of velocity which shewed they were considerably heavier than the atmosphere.

On every side as the observer turned his eyes might he behold a continual succession of fresh flakes falling into his sight, and twinkling like stars as they turned their sides towards the sun.

How far this wonderful shower extended would be difficult to say; but we know that it reached *Bradley*,[1] *Selborne*, and *Alresford*, three places which lie in a sort of a triangle, the shortest of whose sides is about eight miles in extent.

At the second of those places there was a gentleman [2] (for whose veracity and intelligent turn we have the greatest veneration) who observed it the moment he got abroad; but concluded that, as soon as he came upon the hill above his house, where he took his morning rides, he should be higher than his meteor, which he imagined might have been blown, like *Thistle-down*, from the common above: but, to his great astonishment, when he rode to the most elevated part of the down, 300 feet above his fields, he found the webs in appearance still as much above him as before; still descending into sight in a constant succession, and twinkling in the sun, so as to draw the attention of the most incurious.

Neither before nor after was any such fall observed; but on this day the flakes hung in the trees and hedges so thick, that a diligent person sent out might have gathered baskets full.

The remark that I shall make on these cobweb-like appearances, called *gossamer*, is, that, strange and superstitious as the notions about them were formerly, nobody in these days doubts but that they are the real production of small spiders, which swarm in the fields in fine weather in autumn, and have a power of shooting out webs from their tails so as to render themselves buoyant, and lighter than air. But why these apterous insects should *that day* take such a wonderful aërial excursion, and why their webs should at once become so gross and material as to be considerably more weighty than air, and to descend with precipitation, is a matter beyond my skill. If I might be allowed to hazard a supposition, I should imagine that those filmy threads, when first shot, might be entangled in the rising dew, and so drawn up, spiders and all, by a brisk evaporation into the region where clouds are formed: and if the spiders have a power of coiling and thickening their webs in the air, as Dr. *Lister* [3] says they have [see his Letters to Mr. *Ray*] then, when they were become heavier than the air, they must fall.

Every day in fine weather, in autumn chiefly, do I see those spiders shooting out their webs and mounting aloft: they will go off from your finger if you will take them into your hand. Last

summer one alighted on my book as I was reading in the parlour; and, running to the top of the page, and shooting out a web, took it's departure from thence. But what I most wondered at was, that it went off with considerable velocity in a place where no air was stirring; and I am sure that I did not assist it with my breath. So that these little crawlers seem to have, while mounting, some locomotive power without the use of wings, and to move in the air faster than the air itself.

[1] At Bradley, a village west of Alton, the author's uncle by marriage, the Rev. Charles White, was rector at the time. On his death in 1763 the author applied for this living, but he was unsuccessful, and stayed at Selborne.

[2] The author's father, John White.

[3] Dr. Martin Lister (*c.* 1638–1712), physician to Queen Anne and an early Fellow of the Royal Society, was conservative as a medical man, but a versatile and speculative scientist. He was the first to suggest the making of geological maps, and he recognised, with Ray, the organic nature of fossils.

LETTER XXIV

TO THE SAME

Selborne, *Aug.* 15, 1775.

DEAR SIR,

THERE is a wonderful spirit of sociality in the brute creation, independent of sexual attachment: the congregating of gregarious birds in the winter is a remarkable instance.

Many horses, though quiet with company, will not stay one minute in a field by themselves: the strongest fences cannot restrain them. My neighbour's horse will not only not stay by himself abroad, but he will not bear to be left alone in a strange stable without discovering the utmost impatience, and endeavouring to break the rack and manger with his fore feet. He has been known to leap out at a stable-window, through which dung was thrown, after company; and yet in other respects is remarkably quiet. Oxen and cows will not fatten by themselves; but will neglect the finest pasture that is not recommended by society. It would be needless to instance in sheep, which constantly flock together.

But this propensity seems not to be confined to animals of the same species; for we know a doe, still alive, that was brought up from a little fawn with a dairy of cows; with them it goes a-field, and with them it returns to the yard. The dogs of the house take no notice of this deer, being used to her; but, if strange dogs come by, a chase ensues; while the master smiles to see his favourite securely leading her pursuers over hedge, or gate, or stile, till she returns to the cows, who, with fierce lowings and menacing horns, drive the assailants quite out of the pasture.

Even great disparity of kind and size does not always prevent social advances and mutual fellowship. For a very intelligent and observant person has assured me that, in the former part of his life, keeping but one horse, he happened also on a time to have but one solitary hen. These two incongruous animals spent much of their time together in a lonely orchard, where they saw no creature but each other. By degrees an apparent regard began to take place between these two sequestered individuals. The fowl would approach the quadruped with notes of complacency, rubbing herself gently against his legs: while the horse would look down with satisfaction, and move with the greatest caution and circumspection, lest he should trample on his diminutive companion. Thus, by mutual good offices, each seemed to console the vacant hours of the other: so that *Milton*, when he puts the following sentiment in the mouth of *Adam*, seems to be somewhat mistaken:

> "Much less can *bird* with *beast*, or fish with fowl,
> "So well converse, nor with the ox the ape."

LETTER XXV

TO THE SAME

Selborne, *Oct.* 2, 1775.

DEAR SIR,

WE have two gangs or hordes of gypsies which infest the south and west of *England*, and come round in their circuit two or three times

in the year. One of these tribes calls itself by the noble name of *Stanley*, of which I have nothing particular to say; but the other is distinguished by an appellative somewhat remarkable—As far as their harsh gibberish can be understood, they seem to say that the name of their clan is *Curleople*: now the termination of this word is apparently *Grecian*: and as *Mezeray* [1] and the gravest historians all agree that these vagrants did certainly migrate from *Egypt* and the East, two or three centuries ago, and so spread by degrees over *Europe*, may not this family-name, a little corrupted, be the very name they brought with them from the *Levant*? It would be matter of some curiosity, could one meet with an intelligent person among them, to inquire whether, in their jargon, they still retain any *Greek* words [2]: the *Greek* radicals will appear in hand, foot, head, water, earth, &c. It is possible that amidst their cant and corrupted dialect many mutilated remains of their native language might still be discovered.

With regard to those peculiar people, the gypsies, one thing is very remarkable, and especially as they came from warmer climates; and that is, that while other beggars lodge in barns, stables, and cow-houses, these sturdy savages seem to pride themselves in braving the severities of winter, and in living *sub dio* the whole year round. Last *September* was as wet a month as ever was known; and yet during those deluges did a young gypsy girl lie-in in the midst of one of our hop-gardens, on the cold ground, with nothing over her but a piece of blanket extended on a few hazel rods bent hoop-fashion, and stuck into the earth at each end, in circumstances too trying for a cow in the same condition: yet within this garden there was a large hop-kiln, into the chambers of which she might have retired, had she thought shelter an object worthy her attention.

Europe itself, it seems, cannot set bounds to the rovings of these vagabonds; for Mr. *Bell*,[3] in his return from *Peking*, met a gang of these people on the confines of *Tartary*, who were endeavouring to penetrate those deserts and try their fortune in *China*.*

* See *Bell's Travels in China.*

Gypsies are called in *French Bohemiens*; in *Italian* and modern *Greek, Zingani.*

I am, &c.

[1] Francis Eudes de Mezerai (1610–83) was a French historian, extremely popular during his lifetime. Although patronised by Richelieu and Colbert he was very independent, taking part in the Fronde and never shrinking from displeasing the Court. He was flagrantly inaccurate; when a contemporary historian told him he had found a thousand blunders in the abridged *Histoire de France* he answered: "Et moi, j'y en ai trouvé deux mille." The Egyptian origin of gipsies had already been discredited by Bellonius, who wrote: "They are esteemed foreigners in Egypt as well as among us." As their language shows, they represent an Indian tribe or caste, which was for some reason banished or displaced in two distinct waves, the first of which reached Byzantium, by way of Persia, and Armenia, between 1100 and 1200. Germany and France were colonised during the fifteenth century, and England about 1500.

[2] Romani is an originally Sanscrit speech, long extinct in England, but still surviving comparatively pure in Wales.

[3] John Bell (1691–1780) accompanied an embassy of Peter the Great to Pekin during 1718–22—the journey out took sixteen months, and the return journey ten. His book, entitled *Travels from St. Petersburg in Russia to various parts of Asia*, appeared in 1763, and forms a minute and interesting account.

LETTER XXVI

TO THE SAME

Selborne, *Nov.* 1, 1775.

DEAR SIR,

"Hic . . . tædæ pingues, hic plurimus ignis
"Semper, et assiduâ postes fuligine nigri."

I SHALL make no apology for troubling you with the detail of a very simple piece of domestic œconomy, being satisfied that you think nothing beneath your attention that tends to utility: the matter alluded to is the use of *rushes* instead of candles, which I am well aware prevails in many districts besides this; but as I know there are countries also where it does not obtain, and as I have considered the subject with some degree of exactness, I shall proceed in my humble story, and leave you to judge of the expediency.

The proper species of *rush* for this purpose seems to be the *juncus conglomeratus*, or common soft rush, which is to be found in most moist pastures, by the sides of streams, and under hedges. These rushes are in best condition in the height of summer; but may be gathered, so as to serve the purpose well, quite on to autumn. It would be needless to add that the largest and longest are best. Decayed labourers, women, and children, make it their business to procure and prepare them. As soon as they are cut they must be flung into water, and kept there; for otherwise they will dry and shrink, and the peel will not run. At first a person would find it no easy matter to divest a rush of it's peel or rind, so as to leave one regular, narrow, even rib from top to bottom that may support the pith: but this, like other feats, soon becomes familiar even to children; and we have seen an old woman, stone-blind, performing this business with great dispatch, and seldom failing to strip them with the nicest regularity. When these *junci* are thus far prepared, they must lie out on the grass to be bleached, and take the dew for some nights, and afterwards be dried in the sun.

Some address is required in dipping these rushes in the scalding fat or grease; but this knack also is to be attained by practice. The careful wife of an industrious *Hampshire* labourer obtains all her fat for nothing; for she saves the scummings of her bacon-pot for this use; and, if the grease abounds with salt, she causes the salt to precipitate to the bottom, by setting the scummings in a warm oven. Where hogs are not much in use, and especially by the sea-side, the coarser animal-oils will come very cheap. A pound of common grease may be procured for four pence; and about six pounds of grease will dip a pound of rushes; and one pound of rushes may be bought for one shilling: so that a pound of rushes, medicated and ready for use, will cost three shillings. If men that keep bees will mix a little wax with the grease, it will give it a consistency, and render it more cleanly, and make the rushes burn longer: mutton-suet would have the same effect.

A good rush, which measured in length two feet four inches and

an half, being minuted, burnt only three minutes short of an hour: and a rush still of greater length has been known to burn one hour and a quarter.

These rushes give a good clear light. Watch lights (coated with tallow), it is true, shed a dismal one, "darkness visible"; but then the wicks of those have *two* ribs of the rind, or peel, to support the pith, while the wick of the dipped rush has but *one*. The *two* ribs are intended to impede the progress of the flame and make the candle last.

In a pound of dry rushes, avoirdupois, which I caused to be weighed and numbered, we found upwards of one thousand six hundred individuals. Now suppose each of these burns, one with another, only half an hour, then a poor man will purchase eight hundred hours of light, a time exceeding thirty-three entire days, for three shillings. According to this account each rush, before dipping, costs $\frac{1}{33}$ of a farthing, and $\frac{1}{11}$ afterwards. Thus a poor family will enjoy $5\frac{1}{2}$ hours of comfortable light for a farthing. An experienced old housekeeper assures me that one pound and an half of rushes completely supplies his family the year round, since working people burn no candle in the long days, because they rise and go to bed by daylight.

Little farmers use rushes much in the short days, both morning and evening, in the dairy and kitchen; but the very poor, who are always the worst œconomists, and therefore must continue very poor, buy an halfpenny candle every evening, which, in their blowing open rooms, does not burn much more than two hours. Thus have they only two hours light for their money instead of eleven.

While on the subject of rural œconomy, it may not be improper to mention a pretty implement of housewifery that we have seen no where else; that is, little neat besoms which our foresters make from the stalks of the *polytricum commune* or *great golden maiden-hair*, which they call *silk-wood*, and find plenty in the bogs. When this moss is well combed and dressed, and divested of it's outer skin, it becomes of a beautiful bright-chestnut colour; and, being

soft and pliant, is very proper for the dusting of beds, curtains, carpets, hangings, &c. If these besoms were known to the brush-makers in town, it is probable they might come much in use for the purpose above-mentioned.*

I am, &c.

LETTER XXVII

TO THE SAME

Selborne, *Dec.* 12, 1775.

Dear Sir,

We had in this village more than twenty years ago an idiot-boy, whom I well remember, who, from a child, shewed a strong propensity to bees; they were his food, his amusement, his sole object. And as people of this cast have seldom more than one point in view, so this lad exerted all his few faculties on this one pursuit. In the winter he dosed away his time, within his father's house, by the fire side, in a kind of torpid state, seldom departing from the chimney-corner; but in the summer he was all alert, and in quest of his game in the fields, and on sunny banks. Honey-bees, humble-bees, and wasps, were his prey wherever he found them: he had no apprehensions from their stings, but would seize them *nudis manibus*, and at once disarm them of their weapons, and suck their bodies for the sake of their honey-bags. Sometimes he would fill his bosom between his shirt and his skin with a number of these captives; and sometimes would confine them in bottles. He was a very *merops apiaster, or bee-bird*; and very injurious to men that kept bees; for he would slide into their bee-gardens, and, sitting down before the stools, would rap with his finger on the hives, and so take the bees as they came out. He has been known to overturn hives for the sake of honey, of which he was passionately fond. Where metheglin [1] was making he would linger round the tubs and vessels, begging a draught of what he called *bee-wine*. As he ran about he used to make a

* A besom of this sort is to be seen in Sir *Ashton Lever's* Museum.

humming noise with his lips, resembling the buzzing of bees. This lad was lean and sallow, and of a cadaverous complexion; and, except in his favourite pursuit, in which he was wonderfully adroit, discovered no manner of understanding. Had his capacity been better, and directed to the same object, he had perhaps abated much of our wonder at the feats of a more modern exhibiter of bees; and we may justly say of him now,

"— — — — — — — — — Thou,
"Had thy presiding star propitious shone,
"Should'st *Wildman* be — — — —."

When a tall youth he was removed from hence to a distant village, where he died, as I understand, before he arrived at manhood.

I am, &c.

[1] Metheglin was a kind of mead. According to a contemporary recipe: "there are divers ways of making it: one of the best whereof follows: Put as much new honey, naturally running from the comb, into spring-water, as that when the honey is thoroughly dissolved an egg will not sink to the bottom, but be just suspended in it; boil this liquor for an hour or more, till such time as the egg swims above the liquor about the breadth of a groat; when very cool, next morning, it may be barrelled up; adding to each 15 gallons an ounce of ginger, as much of mace and cloves, and half as much cinnamon, all grossly pounded; a spoonful of yeast may be also added at the bung-hole to promote the fermentation. When it has done working, it may be closely stopped up, and after it has stood a month, it should be drawn off into bottles."

LETTER XXVIII

TO THE SAME

Selborne, *Jan.* 8, 1776.

Dear Sir,

It is the hardest thing in the world to shake off superstitious prejudices: they are sucked in as it were with our mother's milk; and, growing up with us at a time when they take the fastest hold and make the most lasting impressions, become so interwoven into our

very constitutions, that the strongest good sense is required to disengage ourselves from them. No wonder therefore that the lower people retain them their whole lives through, since their minds are not invigorated by a liberal education, and therefore not enabled to make any efforts adequate to the occasion.

Such a preamble seems to be necessary before we enter on the superstitions of this district, lest we should be suspected of exaggeration in a recital of practices too gross for this enlightened age.

But the people of *Tring*,[1] in *Hertfordshire*, would do well to remember, that no longer ago than the year 1751, and within twenty miles of the capital, they seized on two superannuated wretches, crazed with age, and overwhelmed with infirmities, on a suspicion of witchcraft; and, by trying experiments, drowned them in a horse-pond.

In a farm-yard near the middle of this village stands, at this day, a row of pollard-ashes, which, by the seams and long cicatrices down their sides, manifestly show that, in former times, they have been cleft asunder. These trees, when young and flexible, were severed and held open by wedges, while ruptured children, stripped naked, were pushed through the apertures, under a persuasion that, by such a process, the poor babes would be cured of their infirmity. As soon as the operation was over, the tree, in the suffering part, was plastered with loam, and carefully swathed up. If the parts coalesced and soldered together, as usually fell out, where the feat was performed with any adroitness at all, the party was cured; but, where the cleft continued to gape, the operation, it was supposed, would prove ineffectual. Having occasion to enlarge my garden not long since, I cut down two or three such trees, one of which did not grow together.

We have several persons now living in the village, who, in their childhood, were supposed to be healed by this superstitious ceremony, derived down perhaps from our *Saxon* ancestors, who practised it before their conversion to Christianity.

At the south corner of the *Plestor*, or area, near the church,

there stood, about twenty years ago, a very old grotesque hollow pollard-ash, which for ages had been looked on with no small veneration as a *shrew-ash*. Now a shrew-ash is an ash whose twigs or branches, when gently applied to the limbs of cattle, will immediately relieve the pains which a beast suffers from the running of a *shrew-mouse* over the part affected: for it is supposed that a shrew-mouse is of so baneful and deleterious a nature, that wherever it creeps over a beast, be it horse, cow, or sheep, the suffering animal is afflicted with cruel anguish, and threatened with the loss of the use of the limb. Against this accident, to which they were continually liable, our provident fore-fathers always kept a shrew-ash at hand, which, when once medicated, would maintain it's virtue for ever. A shrew-ash was made thus * :—Into the body of the tree a deep hole was bored with an auger, and a poor devoted shrew-mouse was thrust in alive, and plugged in, no doubt, with several incantations long since forgotten. As the ceremonies necessary for such a consecration are no longer understood, all succession is at an end, and no such tree is known to subsist in the manor, or hundred.

As to that on the *Plestor*,

"The late vicar stubb'd and burnt it,"

when he was way-warden, regardless of the remonstrances of the by-standers, who interceded in vain for it's preservation, urging it's power and efficacy, and alledging that it had been

"Religione patrum multos servata per annos".

I am, &c.

[1] Tring is thirty-three miles from London. The theory was that on being lowered gently into a pond an innocent person would sink and a guilty one swim. It was derived from the very ancient trial by ordeal—the laws of Athelstan enact that "if the ordeal is by water he shall sink to a depth of one-and-a-half ells on the rope" for an accused man to clear himself. The classic instance of the practice as a test of witchcraft is the career a century earlier of Matthew Hopkins, the itinerant "Witch Finder

* For a similar practice, see *Plot's Staffordshire*.

Generall " who procured the execution of great numbers of witches, placing them in pools, tied up, with their thumbs and toes crossed. He claimed sixty victims in Essex during one year, and in Suffolk was responsible for nearly forty executions at Bury St. Edmunds alone. His zeal had an unhappy climax ; being himself accused and thrown into a pond with thumbs and toes crossed he " swam " like the others and was hanged in 1647. It was probably some recollection of this that inspired the people of Tring.

LETTER XXIX

TO THE SAME

Selborne, *Feb.* 7, 1776.

Dear Sir,

In heavy fogs, on elevated situations especially, trees are perfect alembics: and no one that has not attended to such matters can imagine how much water one tree will distil in a night's time, by condensing the vapour, which trickles down the twigs and boughs, so as to make the ground below quite in a float. In *Newton-lane*, in *October* 1775, on a misty day, a particular oak in leaf dropped so fast that the cart-way stood in puddles and the ruts ran with water, though the ground in general was dusty.

In some of our smaller islands in the *West-Indies*, if I mistake not, there are no springs or rivers ; but the people are supplied with that necessary element, water, merely by the dripping of some large tall trees, which, standing in the bosom of a mountain, keep their heads constantly enveloped with fogs and clouds, from which they dispense their kindly never-ceasing moisture ; and so render those districts habitable by condensation alone.

Trees in leaf have such a vast proportion more of surface than those that are naked, that, in theory, their condensations should greatly exceed those that are stripped of their leaves ; but, as the former *imbibe* also a great quantity of moisture, it is difficult to say which drip most: but this I know, that deciduous trees that are entwined with much ivy seem to distil the greatest quantity. Ivy-leaves are smooth, and thick, and cold, and therefore condense very

fast; and besides ever-greens imbibe very little. These facts may furnish the intelligent with hints concerning what sorts of trees they should plant round small ponds that they would wish to be perennial; and shew them how advantageous some trees are in preference to others.

Trees perspire profusely, condense largely, and check evaporation so much, that woods are always moist: no wonder therefore that they contribute much to pools and streams.

That trees are great promoters of lakes and rivers appears from a well known fact in *North-America*; for, since the woods and forests have been grubbed and cleared, all bodies of water are much diminished; so that some streams, that were very considerable a century ago, will not now drive a common mill.* Besides, most woodlands, forests, and chases, with us abound with pools and morasses; no doubt for the reason given above.

To a thinking mind few phenomena are more strange than the state of little ponds on the summits of chalk-hills, many of which are never dry in the most trying droughts of summer. On *chalk-hills* I say, because in many rocky and gravelly soils springs usually break out pretty high on the sides of elevated grounds and mountains; but no person acquainted with chalky districts will allow that they ever saw springs in such a soil but in vallies and bottoms, since the waters of so pervious a stratum as chalk all lie on one dead level, as well-diggers have assured me again and again.

Now we have many such little round ponds in this district; and one in particular on our sheep-down, three hundred feet above my house; which, though never above three feet deep in the middle, and not more than thirty feet in diameter, and containing perhaps not more than two or three hundred hogsheads of water, yet never is known to fail, though it affords drink for three hundred or four hundred sheep, and for at least twenty head of large cattle beside. This pond, it is true, is over-hung with two moderate beeches, that, doubtless, at times afford it much supply: but then we have others

* Vide *Kalm's* Travels to *North-America*.

as small, that, without the aid of trees, and in spite of evaporation from sun and wind, and perpetual consumption by cattle, yet constantly maintain a moderate share of water, without overflowing in the wettest seasons, as they would do if supplied by springs. By my journal of *May* 1775, it appears that "the small and even considerable ponds in the vales are now dried up, while the small "ponds on the very tops of hills are but little affected". Can this difference be accounted for from evaporation alone, which certainly is more prevalent in bottoms? or rather have not those elevated pools some unnoticed recruits, which in the night time counter-balance the waste of the day; without which the cattle alone must soon exhaust them? And here it will be necessary to enter more minutely into the cause. Dr. *Hales*,[1] in his Vegetable Statics, advances, from experiment, that "the moister the earth is the more dew falls on it "in a night: and more than a *double* quantity of dew falls on a surface "of *water* than there does on an equal surface of moist earth". Hence we see that water, by it's coolness, is enabled to assimilate to itself a large quantity of moisture nightly by condensation; and that the air, when loaded with fogs and vapours, and even with copious dews, can alone advance a considerable and never-failing resource. Persons that are much abroad, and travel early and late, such as shepherds, fishermen, &c. can tell what prodigious fogs prevail in the night on elevated downs, even in the hottest parts of summer; and how much the surfaces of things are drenched by those swimming vapours, though, to the senses, all the while, little moisture seems to fall.

I am, &c.

[1] The Rev. Stephen Hales, D.D. (1677–1761), was Rector of Faringdon, near Selborne, from 1722 until his death, but only resided there occasionally. He served the cure of Teddington, and was a friend of Alexander Pope, whose will he witnessed. In the founding of the science of physiology his work ranks second only to Harvey's, and the careful quantitative experiments in his *Vegetable Statics* are still of fundamental importance. But his speculation had a very practical and homely turn, and he made innumerable small inventions and improvements; according to a letter of the author's to Robert Marsham it was he who was responsible for "teaching the house-wife to

place an inverted tea-cup at the bottom of her pies and tarts to prevent the syrop from boiling over, and to preserve the juice ". It was on his advice also that Robert Marsham began in 1736 to keep a phenological record which has been continued by his descendants ever since, and it is at least possible that the author's own journal of natural history was kept (from 1751 onwards) at his instigation.

LETTER XXX

TO THE SAME

Selborne, *April* 3, 1776.

DEAR SIR,

MONSIEUR HERISSANT, a *French* anatomist, seems persuaded that he has discovered the reason why cuckoos do not hatch their own eggs; the impediment, he supposes, arises from the internal structure of their parts, which incapacitates them for incubation.[1] According to this gentleman, the crop, or craw of a cuckoo does not lie before the sternum at the bottom of the neck, as in the *gallinæ*, *columbæ*, &c., but immediately behind it, on and over the bowels, so as to make a large protuberance in the belly.*

Induced by this assertion, we procured a cuckoo; and, cutting open the breast-bone, and exposing the intestines to sight, found the crop lying as mentioned above. This stomach was large and round, and stuffed hard like a pin-cushion with food, which, upon nice examination, we found to consist of various insects; such as small scarabs, spiders, and dragon-flies; the last of which we have seen cuckoos catching on the wing as they were just emerging out of the aurelia state. Among this farrago also were to be seen maggots, and many seeds, which belonged either to gooseberries, currants, cranberries, or some such fruit; so that these birds apparently subsist on insects and fruits: nor was there the least appearance of bones, feathers, or fur, to support the idle notion of their being birds of prey.

The sternum in this bird seemed to us to be remarkably short,

* *Histoire de l'Académie Royale*, 1752.

between which and the anus lay the crop, or craw, and immediately behind that the bowels against the back-bone.

It must be allowed, as this anatomist observes, that the crop placed just upon the bowels, must, especially when full, be in a very uneasy situation during the business of incubation; yet the test will be to examine whether birds that are actually known to sit for certain are not formed in a similar manner. This inquiry I proposed to myself to make with a *fern-owl*, or goat-sucker, as soon as opportunity offered: because, if their formation proves the same, the reason for incapacity in the cuckoo will be allowed to have been taken up somewhat hastily.

Not long after a fern-owl was procured, which, from it's habit and shape, we suspected might resemble the cuckoo in it's internal construction. Nor were our suspicions ill-grounded; for, upon the dissection, the crop, or craw, also lay behind the sternum, immediately on the viscera, between them and the skin of the belly. It was bulky, and stuffed hard with large *phalænæ*, moths of several sorts, and their eggs, which no doubt had been forced out of those insects by the action of swallowing.

Now as it appears that this bird, which is so well known to practise incubation, is formed in a similar manner with cuckoos, Monsieur *Herissant's* conjecture, that cuckoos are incapable of incubation from the disposition of their intestines, seems to fall to the ground: and we are still at a loss for the cause of that strange and singular peculiarity in the instance of the *cuculus canorus*.

We found the case to be the same with the ring-tail hawk, in respect to formation; and, as far as I can recollect, with the swift; and probably it is so with many more sorts of birds that are not granivorous.

I am, &c.

[1] The great disseminator of this fallacy was Linnæus, who had written ten years before, in the famous XIIth Edition of his *Systema Naturae*: "Coccyx, incubandi ipse impotens. . . ." The alleged obstacle was not the crop but the stomach; there are exotic cuckoos which regularly incubate their own eggs.

LETTER XXXI

TO THE SAME

Selborne, *April* 29, 1776.

DEAR SIR,

ON *August* the 4th, 1775, we surprised a large viper, which seemed very heavy and bloated, as it lay in the grass basking in the sun. When we came to cut it up, we found that the abdomen was crowded with young, fifteen in number; the shortest of which measured full seven inches, and were about the size of full-grown earth-worms. This little fry issued into the world with the true viper-spirit about them, shewing great alertness as soon as disengaged from the belly of the dam: they twisted and wriggled about, and set themselves up, and gaped very wide when touched with a stick, shewing manifest tokens of menace and defiance, though as yet they had no manner of fangs that we could find, even with the help of our glasses.

To a thinking mind nothing is more wonderful than that early instinct which impresses young animals with the notion of the situation of their natural weapons, and of using them properly in their own defence, even before those weapons subsist or are formed. Thus a young cock will spar at his adversary before his spurs are grown; and a calf or a lamb will push with their heads before their horns are sprouted. In the same manner did these young adders attempt to bite before their fangs were in being. The dam however was furnished with very formidable ones, which we lifted up (for they fold down when not used) and cut them off with the point of our scissors.

There was little room to suppose that this brood had ever been in the open air before; and that they were taken in for refuge, at the mouth of the dam, when she perceived that danger was approaching; because then probably we should have found them somewhere in the neck, and not in the abdomen.

LETTER XXXII

TO THE SAME

CASTRATION has a strange effect: it emasculates both man, beast, and bird, and brings them to a near resemblance of the other sex. Thus eunuchs have smooth unmuscular arms, thighs and legs; and broad hips, and beardless chins, and squeaking voices. Gelt-stags and bucks have hornless heads, like hinds and does. Thus wethers have small horns, like ewes; and oxen large bent horns, and hoarse voices when they low, like cows: for bulls have short straight horns; and though they mutter and grumble in a deep tremendous tone, yet they low in a shrill high key. Capons have small combs and gills, and look pallid about the head, like pullets; they also walk without any parade, and hover chickens like hens. Barrow-hogs have also small tusks like sows.

Thus far it is plain that the deprivation of *masculine vigour* puts a stop to the growth of those parts or appendages that are looked upon as it's insignia. But the ingenious Mr. *Lisle*,[1] in his book on husbandry, carries it much farther; for he says that the loss of those insignia alone has sometimes a strange effect on the ability itself: he had a boar so fierce and venereous, that, to prevent mischief, orders were given for his tusks to be broken off. No sooner had the beast suffered this injury than his powers forsook him, and he neglected those females to whom before he was passionately attached, and from whom no fences could restrain him.

[1] He belonged to the same family as Lady Alice Lisle who was executed for harbouring fugitives after Monmouth's rebellion, and was grandfather of the Miss Lisle who married Christopher Taylor, vicar of Selborne from 1784.

LETTER XXXIII

TO THE SAME

THE natural term of an hog's life is little known, and the reason is plain—because it is neither profitable nor convenient to keep that

turbulent animal to the full extent of it's time: however, my neighbour, a man of substance, who had no occasion to study every little advantage to a nicety, kept an half bred Bantam-sow, who was as thick as she was long, and whose belly swept on the ground till she was advanced to her seventeenth year; at which period she shewed some tokens of age by the decay of her teeth and the decline of her fertility.

For about ten years this prolific mother produced two litters in the year of about ten at a time, and once above twenty at a litter; but, as there were near double the number of pigs to that of teats many died. From long experience in the world this female was grown very sagacious and artful:—when she found occasion to converse with a boar she used to open all the intervening gates, and march, by herself, up to a distant farm where one was kept; and when her purpose was served would return by the same means. At the age of about fifteen her litters began to be reduced to four or five; and such a litter she exhibited when in her fatting-pen. She proved, when fat, good bacon, juicy, and tender; the rind, or sward, was remarkably thin. At a moderate computation she was allowed to have been the fruitful parent of three hundred pigs: a prodigious instance of fecundity in so large a quadruped! She was killed in spring 1775.

I am, &c.

LETTER XXXIV

TO THE SAME

Selborne, *May* 9, 1776.

Dear Sir,

"———— admorunt ubera tigres."

We have remarked in a former letter how much incongruous animals, in a lonely state, may be attached to each other from a spirit of sociality; in this it may not be amiss to recount a different motive which has been known to create as strange a fondness.

My friend had a little helpless *leveret* brought to him, which the servants fed with milk in a spoon, and about the same time his cat

kittened and the young were dispatched and buried. The hare was soon lost, and supposed to be gone the way of most fondlings, to be killed by some dog or cat. However, in about a fortnight, as the master was sitting in his garden in the dusk of the evening, he observed his cat, with tail erect, trotting towards him, and calling with little short inward notes of complacency, such as they use towards their kittens, and something gamboling after, which proved to be the leveret that the cat had supported with her milk, and continued to support with great affection.

Thus was a graminivorous animal nurtured by a carnivorous and predaceous one!

Why so cruel and sanguinary a beast as a cat, of the ferocious genus of *Feles*, the *murium leo*,[1] as *Linnæus* calls it, should be affected with any tenderness towards an animal which is it's natural prey, is not so easy to determine.

This strange affection probably was occasioned by that desiderium, those tender maternal feelings, which the loss of her kittens had awakened in her breast; and by the complacency and ease she derived to herself from the procuring her teats to be drawn, which were too much distended with milk, till, from habit, she became as much delighted with this foundling as if it had been her real offspring.

This incident is no bad solution of that strange circumstance which grave historians as well as the poets assert, of exposed children being sometimes nurtured by female wild beasts that probably had lost their young. For it is not one whit more marvellous that *Romulus* and *Remus*, in their infant state, should be nursed by a she-wolf, than that a poor little sucking leveret should be fostered and cherished by a bloody grimalkin.

"— — — — viridi fœtam Mavortis in antro
" Procubuisse lupam: geminos huic ubera circum
" Ludere pendentes pueros, et lambere matrem
" Impavidos: illam tereti cervice reflexam
" Mucere alternos, et corpora fingere linquâ."

[1] "The lion of mice."

LETTER XXXV

TO THE SAME

Selborne, *May* 20, 1770.

Dear Sir,

Lands that are subject to frequent inundations are always poor; and probably the reason may be because the worms are drowned. The most insignificant insects and reptiles are of much more consequence, and have much more influence in the œconomy of Nature, than the incurious are aware of; and are mighty in their effect, from their minuteness, which renders them less an object of attention; and from their numbers and fecundity. Earth-worms, though in appearance a small and despicable link in the chain of Nature, yet, if lost, would make a lamentable chasm. For, to say nothing of half the birds, and some quadrupeds which are almost entirely supported by them, worms seem to be the great promoters of vegetation, which would proceed but lamely without them, by boring, perforating, and loosening the soil, and rendering it pervious to rains and the fibres of plants, by drawing straws and stalks of leaves and twigs into it; and, most of all, by throwing up such infinite numbers of lumps of earth called worm-casts, which, being their excrement, is a fine manure for grain and grass. Worms probably provide new soil for hills and slopes where the rain washes the earth away; and they affect slopes, probably to avoid being flooded. Gardeners and farmers express their detestation of worms; the former because they render their walks unsightly, and make them much work: and the latter because, as they think, worms eat their green corn. But these men would find that the earth without worms would soon become cold, hard-bound, and void of fermentation; and consequently steril: and besides, in favour of worms, it should be hinted that green corn, plants, and flowers, are not so much injured by them as by many species of *coleoptera* (scarabs), and *tipulæ* (long-legs) in their larva, or grub-state; and by unnoticed myriads of small shell-less snails,

called slugs, which silently and imperceptibly make amazing havoc in the field and garden.*

These hints we think proper to throw out in order to set the inquisitive and discerning to work.

A good monography of worms would afford much entertainment and information at the same time, and would open a large and new field in natural history. Worms work most in the spring; but by no means lie torpid in the dead months; are out every mild night in the winter, as any person may be convinced that will take the pains to examine his grass-plots with a candle; are hermaphrodites, and much addicted to venery, and consequently very prolific.

I am, &c.

LETTER XXXVI

TO THE SAME

Selborne, *Nov.* 22, 1777.

DEAR SIR,

YOU cannot but remember that the twenty-sixth and twenty-seventh of last *March* were very hot days; so sultry that everybody complained and were restless under those sensations to which they had not been reconciled by gradual approaches.

This sudden summer-like heat was attended by many summer coincidences; for on those two days the thermometer rose to sixty-six in the shade; many species of insects revived and came forth; some bees swarmed in this neighbourhood; the old tortoise, near *Lewes*, in *Sussex*, awakened and came forth out of it's dormitory; and, what is most to my present purpose, many *house-swallows* appeared and were very alert in many places, and particularly at *Cobham*, in *Surrey*.

* Farmer *Young*, of *Norton-farm*, says that this spring (1777) about four acres of his wheat in one field was entirely destroyed by *slugs*, which swarmed on the blades of corn, and devoured it as fast as it sprang.

But as that short warm period was succeeded as well as preceded by harsh severe weather, with frequent frosts and ice, and cutting winds, the insects withdrew, the tortoise retired again into the ground, and the swallows were seen no more until the tenth of *April*, when, the rigour of the spring abating, a softer season began to prevail.

Again; it appears by my journals for many years past, that *house-martins* retire, to a bird, about the beginning of *October*; so that a person not very observant of such matters would conclude that they had taken their last farewell: but then it may be seen in my diaries also that considerable flocks have discovered themselves again in the first week of *November*, and often on the fourth day of that month only *for one day*; and that not as if they were in actual migration, but playing about at their leisure and feeding calmly, as if no enterprize of moment at all agitated their spirits. And this was the case in the beginning of this very month; for, on the fourth of *November*, more than twenty house-martins, which, in appearance, had all departed about the seventh of *October*, were seen again, for that *one morning only*, sporting between my fields and *the Hanger*, and feasting on insects which swarmed in that sheltered district. The preceding day was wet and blustering, but the fourth was dark and mild, and soft, the wind at south-west, and the thermometer at 58′ ½; a pitch not common at that season of the year. Moreover, it may not be amiss to add in this place, that whenever the thermometer is above 50 the bat comes flitting out in every autumnal and winter-month.

From all these circumstances laid together, it is obvious that torpid insects, reptiles, and quadrupeds, are awakened from their profoundest slumbers by a little untimely warmth; and therefore that nothing so much promotes this death-like stupor as a defect of heat. And farther, it is reasonable to suppose that two whole species, or at least many individuals of those two species, of *British hirundines*, do never leave this island at all, but partake of the same benumbed state: for we cannot suppose that, after a month's absence, house-

martins can return from southern regions to appear for *one* morning in *November*, or that house-swallows should leave the districts of *Africa* to enjoy, in *March*, the transient summer of a *couple* of days.

I am, &c.

LETTER XXXVII

TO THE SAME

Selborne, *Jan.* 8, 1778.

Dear Sir,

There was in this village several years ago a miserable pauper, who, from his birth, was afflicted with a leprosy,[1] as far as we are aware of a singular kind, since it affected only the palms of his hands and the soles of his feet. This scaly eruption usually broke out twice in the year, at the spring and fall; and, by peeling away, left the skin so thin and tender that neither his hands or feet were able to perform their functions; so that the poor object was half his time on crutches, incapable of employ, and languishing in a tiresome state of indolence and inactivity. His habit was lean, lank, and cadaverous. In this sad plight he dragged on a miserable existence, a burden to himself and his parish, which was obliged to support him till he was relieved by death at more than thirty years of age.

The good women, who love to account for every defect in children by the doctrine of longing, said that his mother felt a violent propensity for oysters, which she was unable to gratify; and that the black rough scurf on his hands and feet were the shells of that fish. We knew his parents, neither of which were lepers; his father in particular lived to be far advanced in years.

In all ages the leprosy has made dreadful havock among mankind. The *Israelites* seem to have been greatly afflicted with it from the most remote times; as appears from the peculiar and repeated injunctions given them in the *Levitical* law.* Nor was the

* See Leviticus, chap. xiii. and xiv.

rancour of this foul disorder much abated in the last period of their commonwealth, as may be seen in many passages of the New Testament.

Some centuries ago this horrible distemper prevailed all *Europe* over; and our forefathers were by no means exempt, as appears by the large provision made for objects labouring under this calamity. There was an hospital for female lepers in the diocese of *Lincoln*, a noble one near *Durham*, three in *London* and *Southwark*, and perhaps many more in or near our great towns and cities. Moreover, some crowned heads, and other wealthy and charitable personages, bequeathed large legacies to such poor people as languished under this hopeless infirmity.[2]

It must therefore, in these days, be, to an humane and thinking person, a matter of equal wonder and satisfaction, when he contemplates how nearly this pest is eradicated, and observes that a leper now is a rare sight. He will, moreover, when engaged in such a train of thought, naturally enquire for the reason. This happy change perhaps may have originated and been continued from the much smaller quantity of salted meat and fish now eaten in these kingdoms; from the use of linen next the skin; from the plenty of better bread; and from the profusion of fruits, roots, legumes, and greens, so common in every family. Three or four centuries ago, before there were any enclosures, sown-grasses, field-turnips, or field-carrots, or hay, all the cattle which had grown fat in summer, and were not killed for winter use, were turned out soon after *Michaelmas* to shift as they could through the dead months; so that no fresh meat could be had in winter or spring. Hence the marvellous account of the vast stores of salted flesh found in the larder of the eldest *Spencer** in the days of *Edward* the Second, even so late in the spring as the third of *May*. It was from magazines like these that the turbulent barons supported in idleness their riotous swarms of retainers ready for any disorder or mischief. But agriculture is now arrived at such a pitch of perfection, that our best and fattest meats are killed in the

* *Viz.*, six hundred bacons, eighty carcasses of beef, and six hundred muttons.

winter; and no man need eat salted flesh, unless he prefers it, that has money to buy fresh.

One cause of this distemper might be, no doubt, the quantity of wretched fresh and salt fish consumed by the commonalty at all seasons as well as in lent; which our poor now would hardly be persuaded to touch.

The use of linen changes, shirts or shifts, in the room of sordid and filthy woollen, long worn next the skin, is a matter of neatness comparatively modern; but must prove a great means of preventing cutaneous ails. At this very time woollen instead of linen prevails among the poorer *Welch*, who are subject to foul eruptions.

The plenty of good wheaten bread that now is found among all ranks of people in the south, instead of that miserable sort which used in old days to be made of barley or beans, may contribute not a little to the sweetening their blood and correcting their juices; for the inhabitants of mountainous districts, to this day, are still liable to the itch and other cutaneous disorders, from a wretchedness and poverty of diet.

As to the produce of a garden, every middle-aged person of observation may perceive, within his own memory, both in town and country, how vastly the consumption of vegetables is increased. Green-stalls in cities now support multitudes in a comfortable state, while gardeners get fortunes. Every decent labourer also has his garden, which is half his support, as well as his delight; and common farmers provide plenty of beans, peas, and greens, for their hinds to eat with their bacon; and those few that do not are despised for their sordid parsimony, and looked upon as regardless of the welfare of their dependants. Potatoes have prevailed in this little district, by means of premiums, within these twenty years only; and are much esteemed here now by the poor, who would scarce have ventured to taste them in the last reign.[3]

Our *Saxon* ancestors certainly had some sort of cabbage, because they call the month of *February sprout-cale*; but, long after their days, the cultivation of gardens was little attended to. The religious,

being men of leisure, and keeping up a constant correspondence with *Italy*, were the first people among us that had gardens and fruit-trees in any perfection, within the walls of their abbies * and priories. The *barons* neglected every pursuit that did not lead to war or tend to the pleasure of the chase.

It was not till gentlemen took up the study of horticulture themselves that the knowledge of gardening made such hasty advances. Lord *Cobham*, Lord *Ila*, and Mr. *Waller of Beaconsfield*, were some of the first people of rank that promoted the elegant science of ornamenting without despising the superintendence of the kitchen quarters and fruit walls.

A remark made by the excellent Mr. *Ray* in his Tour of *Europe* at once surprises us, and corroborates what has been advanced above; for we find him observing, so late as his days, that "the *Italians* "use several herbs for sallets, which *are not yet* or have not been but "*lately* used in *England*, viz. *selleri* (celery) which is nothing else "but the sweet smallage; the young shoots whereof, with a little "of the head of the root cut off, they eat raw with oil and pepper". And farther he adds "*curled endive* blanched is much used beyond "seas; and, for a raw sallet, seemed to excel lettuce itself". Now this journey was undertaken no longer ago than in the year 1663.

I am, &c.

[1] This was the less severe type of leprosy—the smooth type—which is chronic over long periods, and is rarely cured. The most remarkable thing about this case seems to have been that it was congenital.

[2] In the Middle Ages there were at least 95 religious hospitals for lepers in Great Britain and 14 in Ireland. Leprosy suddenly vanished from a large part of Europe for some unknown reason during the fifteenth century, but still occurs in Norway, Spain, and elsewhere.

[3] It took Coke of Norfolk five years potato propaganda to convince his tenants that perhaps "'t wouldn't poison tha pigs". This whole passage, coming from intimate knowledge, is a most valuable picture of the condition of the Hampshire labourers

* "In *monasteries* the lamp of knowledge continued to burn, however dimly. "In them men of business were formed for the state: the art of writing was cultivated by the *monks*; they were the only proficients in mechanics, *gardening*, and "architecture." See *Dalrymple's* Annals of *Scotland*.

during the Agricultural Revolution. Elsewhere potatoes were later in becoming a general food, and the standard of living was lower, especially during the hard years of the war with France. Eden in 1797 speaks of " the unvarying meal of dry bread and cheese from week's end to week's end " with beer, or more often only tea, the better off having roast meat or bacon only once a week.

LETTER XXXVIII

TO THE SAME

" Fortè puer, comitum seductus ab agmine fido,
" Dixerat, ecquis adest? et, adest, responderat echo.
" Hic stupet; utque aciem partes divisit in omnes;
" Voce, veni, clamat magna. Vocat illa vocantem."

Selborne, *Feb.* 12, 1778.

Dear Sir,

In a district so diversified as this, so full of hollow vales and hanging woods, it is no wonder that echoes should abound. Many we have discovered that return the cry of a pack of dogs, the notes of a hunting-horn, a tunable ring of bells, or the melody of birds, very agreeably: but we were still at a loss for a polysyllabical, articulate echo, till a young gentleman, who had parted from his company in a summer evening walk, and was calling after them, stumbled upon a very curious one in a spot where it might least be expected. At first he was much surprised, and could not be persuaded but that he was mocked by some boy; but, repeating his trials in several languages, and finding his respondent to be a very adroit polyglot, he then discerned the deception.

This echo in an evening, before rural noises cease, would repeat ten syllables most articulately and distinctly, especially if quick dactyls were chosen. The last syllables of

" Tityre, tu patulæ recubans . . ."

were as audibly and intelligibly returned as the first: and there is no doubt, could trial have been made, but that at midnight, when the air is very elastic, and a dead stillness prevails, one or two syllables

more might have been obtained; but the distance rendered so late an experiment very inconvenient.

Quick dactyls, we observed, succeeded best; for when we came to try it's powers in slow, heavy, embarrassed spondees of the same number of syllables,

"Monstrum horrendum, informe, ingens . . ."

we could perceive a return but of four or five.

All echoes have some one place to which they are returned stronger and more distinct than to any other; and that is always the place that lies at right angles with the object of repercussion, and is not too near, nor too far off. Buildings, or naked rocks, re-echo much more articulately than hanging wood or vales; because in the latter the voice is as it were entangled, and embarrassed in the covert, and weakened in the rebound.

The true object of this echo, as we found by various experiments, is the stone-built, tiled hop-kiln in *Gally-lane*, which measures in front 40 feet, and from the ground to the eaves 12 feet. The true *centrum phonicum*, or just distance, is one particular spot in the *King's-field*, in the path to *Nore-hill*, on the very brink of the steep balk above the hollow cart way. In this case there is no choice of distance; but the path, by meer contingency, happens to be the lucky, the identical spot, because the ground rises or falls so immediately, if the speaker either retires or advances, that his mouth would at once be above or below the object.

We measured this polysyllabical echo with great exactness, and found the distance to fall very short of Dr. *Plot's* rule for distinct articulation: for the Doctor, in his history of *Oxfordshire*, allows 120 feet for the return of each syllable distinctly: hence this echo, which gives ten distinct syllables, ought to measure 400 yards, or 120 feet to each syllable; whereas our distance is only 258 yards, or near 75 feet, to each syllable. Thus our measure falls short of the Doctor's, as five to eight: but then it must be acknowledged that this candid philosopher was convinced afterwards, that some latitude

must be admitted of in the distance of echoes according to time and place.

When experiments of this sort are making, it should always be remembered that weather and the time of day have a vast influence on an echo; for a dull, heavy, moist air deadens and clogs the sound; and hot sunshine renders the air thin and weak, and deprives it of all it's springiness; and a ruffling wind quite defeats the whole. In a still, clear, dewy evening the air is most elastic; and perhaps the later the hour the more so.

Echo has always been so amusing to the imagination, that the poets have personified her; and in their hands she has been the occasion of many a beautiful fiction. Nor need the gravest man be ashamed to appear taken with such a phænomenon, since it may become the subject of philosophical or mathematical inquiries.

One should have imagined that echoes, if not entertaining, must at least have been harmless and inoffensive; yet *Virgil* advances a strange notion, that they are injurious to bees. After enumerating some probable and reasonable annoyances, such as prudent owners would wish far removed from their bee-gardens, he adds

"— — — — — — aut ubi concava pulsu
"Saxa sonant, vocisque offensa resultat imago."

This wild and fanciful assertion will hardly be admitted by the philosophers of these days; especially as they all now seem agreed that insects are not furnished with any organs of hearing at all. But if it should be urged, that though they cannot *hear* yet perhaps they may *feel* the repercussions of sounds, I grant it is possible they may. Yet that these impressions are distasteful or hurtful, I deny, because bees, in good summers, thrive well in my outlet, where the echoes are very strong: for this village is another *Anathoth*,[1] a place of *responses* or *echoes*. Besides, it does not appear from experiment that bees are in any way capable of being affected by sounds: for I have often tried my own with a large speaking-trumpet held close to their hives, and with such an exertion of voice as would have

hailed a ship at the distance of a mile, and still these insects pursued their various employments undisturbed, and without shewing the least sensibility or resentment.

Some time since it's discovery this echo is become totally silent, though the object, or hop-kiln, remains: nor is there any mystery in this defect; for the field between is planted as an hop-garden, and the voice of the speaker is totally absorbed and lost among the poles and entangled foliage of the hops. And when the poles are removed in autumn the disappointment is the same; because a tall quick-set hedge, nurtured up for the purpose of shelter to the hop ground, entirely interrupts the impulse and repercussion of the voice: so that till those obstructions are removed no more of it's garrulity can be expected.

Should any gentleman of fortune think an echo in his park or outlet a pleasing incident, he might *build* one at little or no expense. For whenever he had occasion for a new barn, stable, dog-kennel, or the like structure, it would be only needful to erect this building on the gentle declivity of an hill, with a like rising opposite to it, at a few hundred yards distance; and perhaps success might be the easier ensured could some canal, lake, or stream, intervene. From a seat at the *centrum phonicum* he and his friends might amuse themselves sometimes of an evening with the prattle of this loquacious nymph; of whose complacency and decent reserve more may be said than can with truth of every individual of her sex; since she is — — — —

"— — — — — — quæ nec *reticere* loquenti,
"Nec *prior* ipsa *loqui* didicit resonabilis echo."

I am, &c.

P.S. The classic reader will, I trust, pardon the following lovely quotation, so finely describing echoes, and so poetically accounting for their causes from popular superstition:

"Quæ benè quom videas, rationem reddere possis
"Tute tibi atque aliis, quo pacto per loca sola
"Saxa pareis formas verborum ex ordine reddant,

" Palanteis comites quom monteis inter opacos
" Quærimus, et magnâ dispersos voce ciemus.
" Sex etiam, aut septem loca vidi reddere voces
" Unam quom jaceres: ita colles collibus ipsis
" Verba repulsantes iterabant dicta referre.
" Hæc loca capripedes Satyros, Nymphasque tenere
" Finitimi fingunt, et Faunos esse loquuntur;
" Quorum noctivago strepitu, ludoque jocanti
" Adfirmant volgo taciturna silentia rumpi,
" Chordarumque sonos fieri, dulceisque querelas,
" Tibia quas fundit digitis pulsata canentum:
" Et genus agricolûm latè sentiscere, quom Pan
" Pinea semiferi capitis velamina quassans,
" Unco sæpe labro calamos percurrit hianteis,
" Fistula silvestrem ne cesset fundere musam."

Lucretius, Lib. iv., l. 576.

[1] " Anathoth with her suburbs " was one of the four cities given by lot from the tribe of Benjamin out of their inheritance to support the Levites (Joshua xxi. 18). The reference is probably to Isaiah x. 30: " Lift up thy voice, O daughter of Gallim; cause it to be heard unto Laish, O poor Anathoth."

LETTER XXXIX

TO THE SAME

Selborne, *May* 13, 1778.

Dear Sir,

Among the many singularities attending those amusing birds the *swifts*, I am now confirmed in the opinion that we have every year the same number of pairs invariably; at least the result of my inquiry, has been exactly the same for a long time past. The swallows and martins are so numerous, and so widely distributed over the village, that it is hardly possible to recount them; while the swifts, though they do not all build in the church, yet so frequently haunt it, and play and rendezvous round it, that they are easily enumerated. The number that I constantly find are *eight pairs*; about half of which reside in the church, and the rest build in some of the lowest and

meanest thatched cottages. Now as these eight pairs, allowance being made for accidents, breed yearly eight pairs more, what becomes annually of this increase; and what determines every spring which pairs shall visit us, and reoccupy their ancient haunts? [1]

Ever since I have attended to the subject of ornithology, I have always supposed that that sudden reverse of affection, that strange *αντιστοργη*, which immediately succeeds in the feathered kind to the most passionate fondness, is the occasion of an equal dispersion of birds over the face of the earth. Without this provision one favourite district would be crowded with inhabitants, while others would be destitute and forsaken. But the parent birds seem to maintain a jealous superiority, and to oblige the young to seek for new abodes: and the rivalry of the males, in many kinds, prevents their crowding the one on the other. Whether the swallows and house-martins return in the same exact number annually is not easy to say, for reasons given above: but it is apparent, as I have remarked before in my Monographies, that the numbers returning bear no manner of proportion to the numbers retiring.

[1] Facts regarding bird population are still scarce, but as a general rule species laying only two or three eggs a season, like the guillemot, ringdove and swift, are very steady in numbers, while those with a high fertility, including swallows and most small passerines, fluctuate considerably from year to year. Comparatively few surplus birds seem to survive until the following breeding season, and these, where the breeding stock can increase no further, are compelled by lack of available territory either to go beyond the occupied range of the species or to remain within it as non-breeding birds—a class sufficiently numerous to fill up any gaps that occur among the nesting pairs.

LETTER XL

TO THE SAME

Selborne, *June* 2, 1778.

Dear Sir,

The standing objection to botany has always been, that it is a pursuit that amuses the fancy and exercises the memory, without improving the mind or advancing any real knowledge: and where the science

is carried no farther than a mere systematic classification, the charge is but too true. But the botanist that is desirous of wiping off this aspersion should be by no means content with a list of names; he should study plants philosophically, should investigate the laws of vegetation, should examine the powers and virtues of efficacious herbs, should promote their cultivation; and graft the gardener, the planter, and the husbandman, on the phytologist. Not that system is by any means to be thrown aside; without system the field of Nature would be a pathless wilderness; but system should be subservient to, not the main object of, pursuit.

Vegetation is highly worthy of our attention; and in itself is of the utmost consequence to mankind, and productive of many of the greatest comforts and elegancies of life. To plants we owe timber, bread, beer, honey, wine, oil, linen, cotton, &c., what not only strengthens our hearts, and exhilarates our spirits, but what secures from inclemencies of weather and adorns our persons. Man, in his true state of nature, seems to be subsisted by spontaneous vegetation: in middle climes, where grasses prevail, he mixes some animal food with the produce of the field and garden: and it is towards the polar extremes only that, like his kindred bears and wolves, he gorges himself with flesh alone, and is driven, to what hunger has never been known to compel the very beasts, to prey on his own species.*

The productions of vegetation have had a vast influence on the commerce of nations, and have been the great promoters of navigation, as may be seen in the articles of sugar, tea, tobacco, opium, ginseng,[1] betel,[1] paper, &c. As every climate has its peculiar produce, our natural wants bring on a mutual intercourse; so that by means of trade each distant part is supplied with the growth of every latitude. But, without the knowledge of plants and their culture, we must have been content with our hips and haws, without enjoying the delicate fruits of *India* and the salutiferous drugs of *Peru*.

Instead of examining the minute distinctions of every various species of each obscure genus, the botanist should endeavour to make

* See the late Voyages to the South-seas.

himself acquainted with those that are useful. You shall see a man readily ascertain every herb of the field, yet hardly know wheat from barley, or at least one sort of wheat or barley from another.

But of all sorts of vegetation the *grasses* seem to be most neglected; neither the farmer nor the grazier seem to distinguish the annual from the perennial, the hardy from the tender, nor the succulent and nutritive from the dry and juiceless.

The study of grasses would be of great consequence to a northerly, and grazing kingdom. The botanist that could improve the swerd of the district where he lived would be an useful member of society: to raise a thick turf on a naked soil would be worth volumes of systematic knowledge; and he would be the best commonwealth's man that could occasion the growth of "*two blades of grass* where *one* alone was seen before".

I am, &c.

[1] American and oriental herbs taken for their roots and leaves respectively.

LETTER XLI

TO THE SAME

Selborne, *July* 3, 1778.

Dear Sir,

In a district so diversified with such a variety of hill and dale, aspects, and soils, it is no wonder that great choice of plants should be found. Chalks, clays, sands, sheep-walks and downs, bogs, heaths, woodlands, and champaign fields, cannot but furnish an ample *Flora*. The deep rocky lanes abound with *filices*, and the pastures and moist woods with *fungi*. If in any branch of botany we may seem to be wanting, it must be in the large aquatic plants, which are not to be expected on a spot far removed from rivers, and lying up amidst the hill country at the spring heads. To enumerate all the plants that have been discovered within our limits would be a needless work; but a short list of the more rare, and the spots where they are to be found,[1] may be neither unacceptable nor unentertaining:—

Helleborus fœtidus, stinking hellebore, bear's foot, or setterwort, —all over the *High-wood* and *Coney-croft-hanger*: this continues a great branching plant the winter through, blossoming about *January*, and is very ornamental in shady walks and shrubberies. The good women give the leaves powdered to children troubled with worms; but it is a violent remedy, and ought to be administered with caution.

Helleborus viridis, green hellebore,—in the deep stony lane on the left hand just before the turning to *Norton-farm*, and at the top of *Middle Dorton* under the hedge: this plant dies down to the ground early in autumn, and springs again about *February*, flowering almost as soon as it appears above ground.

Vaccinium oxycoccos, creeping bilberries, or cranberries,—in the bogs of *Bin's-pond*;

Vaccinium myrtillus, whortle, or bilberries,—on the dry hillocks of *Wolmer-forest*;

Drosera rotundifolia, round-leaved sundew.
——— *longifolia*, long-leaved ditto. } In the bogs of *Bin's-pond*.

Comarum palustre, purple comarum, or marsh cinque foil,—in the bogs of *Bin's-pond*;

Hypericum androsæmum, Tutsan, St. John's Wort,—in the stony, hollow lanes;

Vinca minor, less periwinkle,—in *Selborne-hanger* and *Shrubwood*;

Monotropa hypopithys, yellow monotropa, or bird's nest,—in *Selborne-hanger* under the shady beeches, to whose roots it seems to be parasitical—at the north-west end of the *Hanger*;

Chlora perfoliata, *Blackstonia perfoliata*, *Hudsoni*, perfoliated yellow-wort,—on the banks in the *King's-field*;

Paris quadrifolia, herb Paris, true-love, or one-berry,—in the *Church-litten-coppice*;

Chrysosplenium oppositifolium, opposite golden saxifrage,—in the dark and rocky hollow lanes;

Gentiana amarella, autumnal gentian, or fellwort,—on the *Zigzag* and *Hanger*;

Lathræa squammaria, tooth-wort,—in the *Church-litten-coppice*

under some hazels near the foot-bridge, in *Trimming's* garden-hedge, and on the dry wall opposite *Grange-yard*;

Dipsacus pilosus, small teasel,—in the *Short* and *Long Lith*;

Lathyrus sylvestris, narrow-leaved, or wild lathyrus,—in the bushes at the foot of the *Short Lith*, near the path;

Ophrys spiralis, ladies traces,—in the *Long Lith*, and towards the south corner of the common;

Ophrys nidus avis, birds' nest ophrys,—in the *Long Lith* under the shady beeches among the dead leaves; in *Great Dorton* among the bushes, and on the *Hanger* plentifully;

Serapias latifolia, helleborine,—in the *High-wood* under the shady beeches;

Daphne laureola, spurge laurel,—in *Selborne-Hanger* and the *High-wood*;

Daphne mezereum, the mezereon,—in *Selborne-Hanger* among the shrubs at the south-east end above the cottages;

Lycoperdon tuber, truffles,—in the *Hanger* and *High-wood*;

Sambucus ebulus, dwarf elder, wallwort, or danewort,—among the rubbish and ruined foundations of the *Priory*.

Of all the propensities of plants none seem more strange than their different periods of blossoming. Some produce their flowers in the winter, or very first dawnings of spring; many when the spring is established; some at midsummer, and some not till autumn. When we see the *helleborus fœtidus* and *helleborus niger* blowing at Christmas, the *helleborus hyemalis* in January, and the *helleborus viridis* as soon as ever it emerges out of the ground, we do not wonder, because they are kindred plants that we expect should keep pace the one with the other. But other congenerous vegetables differ so widely in their time of flowering that we cannot but admire. I shall only instance at present in the *crocus sativus*, the vernal, and the autumnal crocus, which have such an affinity, that the best botanists only make them varieties of the same *genus*, of which there is only one *species*; not being able to discern any difference in the *corolla*, or in the internal structure. Yet the *vernal crocus* expands it's flowers by

the beginning of March at farthest, and often in very rigorous weather; and cannot be retarded but by some violence offered:—while the *autumnal* (the *Saffron*) defies the influence of the spring and summer, and will not blow till the most plants begin to fade and run to seed. This circumstance is one of the wonders of the creation, little noticed, because a common occurrence: yet ought not to be overlooked on account of it's being familiar, since it would be as difficult to be explained as the most stupendous phænomenon in nature.

"Say, what impels, amidst surrounding snow
Congeal'd, the *crocus'* flamy bud to glow?
Say, what retards, amidst the summer's blaze,
Th' *autumnal bulb*, till pale, declining days?
The GOD of SEASONS; whose pervading power
Controls the sun, or sheds the fleecy shower:
He bids each flower his quick'ning word obey;
Or to each lingering bloom enjoins delay."

[1] Selborne Hanger covers the side of Selborne Down, facing north-east towards the village; Shrubwood clothed the eastern spur, but has since grown up with beech like the rest; the King's field is on the side facing south-east, towards Nore Hill; the High-wood covers the summit; Coneycroft Hanger is the opposite side, facing north-west. The deep stony lane is the old Alton road; Dorton is east of the church, towards the Priory, with Short and Long Lith; the church-litten was the churchyard; Grange Farm is in Gracious Street, at the north end of Selborne village.

[2] Several species of crocus are now distinguished even in the English flora; for equation of the plants mentioned in this letter with modern nomenclature see Synonymy, page 412.

LETTER XLII

TO THE SAME

"Omnibus animalibus reliquis certus et uniusmodi, et in suo cuique genere "incessus est: aves solæ vario meatu feruntur, et in terrâ, et in æere." [1]
PLIN., Hist. Nat., lib. x., cap. 38.

Selborne, *Aug.* 7, 1778.

DEAR SIR,

A GOOD ornithologist should be able to distinguish birds by their air as well as by their colours and shape; on the ground as well

as on the wing, and in the bush as well as in the hand. For, though it must not be said that every *species* of birds has a manner peculiar to itself, yet there is somewhat in most *genera* at least, that at first sight discriminates them, and enables a judicious observer to pronounce upon them with some certainty. Put a bird in motion

"— — Et vera incessu patuit — — — —."

Thus *kites* and *buzzards* sail round in circles with wings expanded and motionless; and it is from their gliding manner that the former are still called in the north of *England gleads*, from the *Saxon* verb *glidan*, to glide. The *kestrel*, or *wind-hover*, has a peculiar mode of hanging in the air in one place, his wings all the while being briskly agitated. *Hen-harriers* fly low over heaths or fields of corn, and beat the ground regularly like a pointer or setting-dog. *Owls* move in a buoyant manner, as if lighter than the air; they seem to want ballast. There is a peculiarity belonging to *ravens* that must draw the attention even of the most incurious—they spend all their leisure time in striking and cuffing each other on the wing in a kind of playful skirmish; and, when they move from one place to another, frequently turn on their backs with a loud croak, and seem to be falling to the ground. When this odd gesture betides them, they are scratching themselves with one foot, and thus lose the centre of gravity.[2] *Rooks* sometimes dive and tumble in a frolicksome manner; *crows* and *daws* swagger in their walk; *wood-peckers* fly *volatu undoso*, opening and closing their wings at every stroke, and so are always rising or falling in curves. All of this genus use their tails, which incline downward, as a support while they run up trees. *Parrots*, like all other hooked-clawed birds, walk aukwardly, and make use of their bill as a third foot, climbing and ascending with ridiculous caution. All the *gallinæ* parade and walk gracefully, and run nimbly; but fly with difficulty, with an impetuous whirring, and in a straight line. *Magpies* and *jays* flutter with powerless wings, and make no dispatch; *herons* seem incumbered with too much sail for their light bodies; but these vast hollow wings are necessary in carrying burdens, such

as large fishes, and the like; *pigeons*, and particularly the sort called *smiters*, have a way of clashing their wings the one against the other over their backs with a loud snap; another variety called *tumblers* turn themselves over in the air. Some birds have movements peculiar to the season of love: thus *ring-doves*, though strong and rapid at other times, yet in the spring hang about on the wing in a toying and playful manner; thus the *cock-snipe*, while breeding, forgetting his former flight, fans the air like the wind-hover; and the *green-finch* in particular exhibits such languishing and faultering gestures as to appear like a wounded and dying bird; the *king-fisher* darts along like an arrow; *fern-owls*, or *goat-suckers*, glance [3] in the dusk over the tops of trees like a meteor; *starlings* as it were swim along, while *missel-thrushes* use a wild and desultory flight; *swallows* sweep over the surface of the ground and water, and distinguish themselves by rapid turns and quick evolutions; *swifts* dash round in circles; and the *bank-martin* moves with frequent vacillations like a butterfly. Most of the small birds fly by jerks, rising and falling as they advance. Most small birds hop; but *wagtails* and *larks* walk, moving their legs alternately. *Skylarks* rise and fall perpendicularly as they sing; *woodlarks* hang poised in the air; and *titlarks* [4] rise and fall in large curves, singing in their descent. The *white-throat* uses odd jerks and gesticulations over the tops of hedges and bushes. All the *duck-kind* waddle; *divers* and *auks* walk as if fettered, and stand erect on their tails: these are the *compedes* of *Linnæus*. *Geese* and *cranes*, and most wild-fowls, move in figured flights, often changing their position. The secondary *remiges* [5] of *Tringæ*, *wild-ducks*, and some others, are very long, and give their wings, when in motion, an hooked appearance. *Dabchicks*, *moor-hens*, and *coots*, fly erect, with their legs hanging down, and hardly make any dispatch,[6] the reason is plain, their wings are placed too forward out of the true centre of gravity; as the legs of *auks* and *divers* are situated too backward.

[1] "All other animals have a definite and uniform mode of progression, each according to its kind: birds alone use a varied motion, both on earth and in the air."

[2] Ravens roll deliberately, in play or in courtship; the feet are extended simply

to recover balance and are not the cause of its loss ; no movement of the foot could give a flying bird an involuntary fall.

[3] The usual flight of the feeding nightjar is easy, noiseless, and gliding ; it gives no impression of speed.

[4] Pipits, both meadow and tree.

[5] Sandpipers and waders generally.

[6] They are clumsy in the short flights they make while retreating to cover, but all three, when well on the wing, are capable of sustained flight at considerable speed.

LETTER XLIII

TO THE SAME

Selborne, *Sept.* 9, 1778.

DEAR SIR,

FROM the motion of birds, the transition is natural enough to their notes and language, of which I shall say something. Not that I would pretend to understand their language like the *vizier* ; who, by the recital of a conversation which passed between two owls, reclaimed a sultan,* before delighting in conquest and devastation ; but I would be thought only to mean that many of the winged tribes have various sounds and voices adapted to express their various passions, wants, and feelings ; such as anger, fear, love, hatred, hunger, and the like. All species are not equally eloquent ; some are copious and fluent as it were in their utterance, while others are confined to a few important sounds : no bird, like the fish kind, is quite mute, though some are rather silent. The language of birds is very ancient, and, like other ancient modes of speech, very elliptical ; little is said, but much is meant and understood.

The notes of the eagle-kind are shrill and piercing ; and about the season of nidification much diversified, as I have been often assured by a curious observer of Nature, who long resided at *Gibraltar*, where eagles abound. The notes of our *hawks* much resemble those of the king of birds. *Owls* have very expressive notes ; they hoot in a fine vocal sound, much resembling the *vox humana*, and reducible

* See *Spectator*, Vol. vii., No. 512.

by a pitch-pipe to a musical key. This note seems to express complacency and rivalry among the males: they use also a quick call [1] and an horrible scream [1]; and can snore and hiss [1] when they mean to menace. *Ravens*, besides their loud croak, can exert a deep and solemn note that makes the woods to echo; the amorous sound of a *crow* is strange and ridiculous; *rooks*, in the breeding season, attempt sometimes in the gaiety of their hearts to sing, but with no great success; the *parrot*-kind have many modulations of voice, as appears by their aptitude to learn human sounds; *doves* coo in an amorous and mournful manner, and are emblems of despairing lovers; the *woodpecker* sets up a sort of loud and hearty laugh; the *fern-owl*, or *goat-sucker*, from the dusk till day-break, serenades his mate with the clattering of castanets. All the tuneful *passeres* express their complacency by sweet modulations, and a variety of melody. The *swallow*, as has been observed in a former letter, by a shrill alarm bespeaks the attention of the other *hirundines*, and bids them be aware that the hawk is at hand. Aquatic and gregarious birds, especially the nocturnal, that shift their quarters in the dark, are very noisy and loquacious; as cranes, wild-geese, wild-ducks, and the like: their perpetual clamour prevents them from dispersing and losing their companions.

In so extensive a subject, sketches and outlines are as much as can be expected; for it would be endless to instance in all the infinite variety of the feathered nation. We shall therefore confine the remainder of this letter to the few domestic fowls of our yards, which are most known, and therefore best understood. At first the *peacock*, with his gorgeous train, demands our attention; but, like most of the gaudy birds, his notes are grating and shocking to the ear: the yelling of cats, and the braying of an ass, are not more disgustful. The voice of the *goose* is trumpet-like, and clanking; and once saved the Capitol at *Rome*, as grave historians assert: the hiss also of the *gander* is formidable and full of menace, and "protective of his young". Among *ducks* [2] the sexual distinction of voice is remarkable; for, while the *quack* of the female is loud and sonorous, the voice of the *drake* is inward and harsh, and feeble, and scarce discernible.

The cock *turkey* struts and gobbles to his mistress in a most uncouth manner; he hath also a pert and petulant note when he attacks his adversary. When a hen *turkey* leads forth her young brood she keeps a watchful eye; and if a bird of prey appear, though ever so high in the air, the careful mother announces the enemy with a little inward moan, and watches him with a steady and attentive look; but, if he approach, her note becomes earnest and alarming, and her outcries are redoubled.

No inhabitants of a yard seem possessed of such a variety of expression and so copious a language as common poultry. Take a chicken of four or five days old, and hold it up to a window where there are flies, and it will immediately seize it's prey, with little twitterings of complacency; but if you tender it a wasp or a bee, at once it's note becomes harsh, and expressive of disapprobation and a sense of danger. When a pullet is ready to lay she intimates the event by a joyous and easy soft note. Of all the occurrences of their life that of *laying* seems to be the most important; for no sooner has a hen disburdened herself, than she rushes forth with a clamorous kind of joy, which the cock and the rest of his mistresses immediately adopt. The tumult is not confined to the family concerned, but catches from yard to yard, and spreads to every homestead within hearing, till at last the whole village is in an uproar. As soon as a hen becomes a mother her new relation demands a new language; she then runs clocking and screaming about, and seems agitated as if possessed. The father of the flock has also a considerable vocabulary; if he finds food, he calls a favourite concubine to partake; and if a bird of prey passes over, with a warning voice he bids his family beware. The gallant *chanticleer* has, at command, his amorous phrases, and his terms of defiance. But the sound by which he is best known is his *crowing*: by this he has been distinguished in all ages as the countryman's clock or larum, as the watchman that proclaims the divisions of the night. Thus the poet elegantly stiles him:

> "— — — the crested cock, whose clarion sounds
> "The silent hours."

A neighbouring gentleman one summer had lost most of his chickens by a sparrow-hawk, that came gliding down between a faggot pile and the end of his house to the place where the coops stood. The owner, inwardly vexed to see his flock thus diminishing, hung a setting net adroitly between the pile and the house, into which the caitiff dashed, and was entangled. Resentment suggested the law of retaliation; he therefore clipped the hawk's wings, cut off his talons, and, fixing a cork on his bill, threw him down among the brood-hens. Imagination cannot paint the scene that ensued; the expressions that fear, rage, and revenge, inspired, were new, or at least such as had been unnoticed before: the exasperated matrons upbraided, they execrated, they insulted, they triumphed. In a word, they never desisted from buffeting their adversary till they had torn him in an hundred pieces.

[1] These are notes of the barn-owl, not of owls generally.
[2] Mallards, not ducks in general.

LETTER XLIV

TO THE SAME

Selborne.

"— — — — monstrent"
"— — — — —"
"Quid tantûm Oceano properent se tingere soles
"Hyberni; vel quæ tardis mora noctibus obstet."

GENTLEMEN who have outlets might contrive to make ornament subservient to utility: a pleasing eye-trap might also contribute to promote science: an obelisk in a garden or park might be both an embellishment and an *heliotrope*.

Any person that is curious, and enjoys the advantage of a good horizon, might, with little trouble, make two *heliotropes*; the one

for the *winter*, the other for the *summer* solstice: and these two erections might be constructed with very little expense; for two pieces of timber frame-work, about ten or twelve feet high, and four feet broad at the base, and close lined with plank, would answer the purpose.

The erection for the former should, if possible, be placed within sight of some window in the common sitting parlour; because men, at that dead season of the year, are usually within doors at the close of the day; while that for the latter might be fixed for any given spot in the garden or outlet: whence the owner might contemplate, in a fine summer's evening, the utmost extent that the sun makes to the *northward* at the season of the longest days. Now nothing would be necessary but to place these two *objects* with so much exactness, that the *westerly* limb of the sun, at setting, might but just clear the *winter heliotrope* to the *west* of it on the *shortest* day; and that the *whole* disc of the sun, at the *longest* day, might exactly at setting also clear the *summer heliotrope* to the *north* of it.

By this simple expedient it would soon appear that there is no such thing, strictly speaking, as a solstice; for, from the *shortest* day, the owner would, every clear evening, see the disc *advancing*, at it's setting, to the *westward* of the object; and, from the *longest* day, observe the sun *retiring* backwards every evening at it's setting, towards the object *westward*, till, in a few nights, it would set quite behind it, and so by degrees to the *west* of it: for when the sun comes near the summer solstice, the whole disc of it would at first set behind the object; after a time the *northern* limb would first appear, and so every night gradually more, till at length the whole diameter would set *northward* of it for about three nights; but on the middle night of the three, sensibly more remote than the former or following. When beginning it's recess from the summer tropic, it would continue more and more to be hidden every night, till at length it would descend quite behind the object again; and so nightly more and more to the *westward*.

LETTER XLV

TO THE SAME

Selborne.

" — — — Mugire videbis
" Sub pedibus terram, et descendere montibus ornos."

When I was a boy I used to read, with astonishment and implicit assent, accounts in *Baker's Chronicle* [1] of walking hills and travelling mountains. *John Philips,*[a] in his *Cyder,* alludes to the credit that was given to such stories with a delicate but quaint vein of humour peculiar to the author of the *Splendid Shilling.*

" I nor advise, nor reprehend the choice
" Of *Marcley Hill*; the apple no where finds
" A kinder mould; yet 'tis unsafe to trust
" Deceitful ground: who knows but that once more
" This mount may journey, and his present site
" Forsaken, to thy neighbour's bounds transfer
" Thy goodly plants, affording matter strange
" For law debates!"

But, when I came to consider better, I began to suspect that though our hills may never have journeyed far, yet that the ends of many of them have slipped and fallen away at distant periods, leaving the cliffs bare and abrupt. This seems to have been the case with *Nore* and *Whetham Hills*; and especially with the ridge between *Harteley Park* and *Ward le ham,* where the ground has slid into vast swellings and furrows; and lies still in such romantic confusion as cannot be accounted for from any other cause. A strange event, that happened not long since, justifies our suspicions; which, though it befell not within the limits of this parish, yet as it was within the hundred of *Selborne,* and as the circumstances were singular, may fairly claim a place in a work of this nature.

The months of *January* and *February,* in the year 1774, were remarkable for great melting snows and vast gluts of rain, so that by the end of the latter month the land-springs, or *lavants,* began

to prevail, and to be near as high as in the memorable winter of 1764. The beginning of *March* also went on in the same tenor; when, in the night between the 8th and 9th of that month, a considerable part of the great woody hanger at *Hawkley* was torn from it's place, and fell down, leaving a high free-stone cliff naked and bare, and resembling the steep side of a chalk-pit. It appears that this huge fragment, being perhaps sapped and undermined by waters, foundered, and was engulfed, going down in a perpendicular direction; for a gate which stood in the field, on the top of the hill, after sinking with it's posts for thirty or forty feet, remained in so true and upright a position as to open and shut with great exactness, just as in it's first situation. Several oaks also are still standing, and in a state of vegetation, after taking the same desperate leap. That great part of this prodigious mass was absorbed in some gulf below, is plain also from the inclining ground at the bottom of the hill, which is free and unincumbered; but would have been buried in heaps of rubbish, had the fragment parted and fallen forward. About an hundred yards from the foot of this hanging coppice stood a cottage by the side of a lane; and two hundred yards lower, on the other side of the lane, was a farm-house, in which lived a labourer and his family; and, just by, a stout new barn. The cottage was inhabited by an old woman and her son, and his wife. These people in the evening, which was very dark and tempestuous, observed that the brick floors of their kitchens began to heave and part; and that the walls seemed to open, and the roofs to crack: but they all agree that no tremor of the ground, indicating an earthquake, was ever felt; only that the wind continued to make a most tremendous roaring in the woods and hangers. The miserable inhabitants, not daring to go to bed, remained in the utmost solicitude and confusion, expecting every moment to be buried under the ruins of their shattered edifices. When day-light came they were at leisure to contemplate the devastations of the night: they then found that a deep rift, or chasm, had opened under their houses, and torn them, as it were, in two; and that one end of the barn had suffered in a similar manner; that a

pond near the cottage had undergone a strange reverse, becoming deep at the shallow end, and so *vice versa*; that many large oaks were removed out of their perpendicular, some thrown down, and some fallen into the heads of neighbouring trees; and that a gate was thrust forward, with it's hedge, full six feet, so as to require a new track to be made to it. From the foot of the cliff the general course of the ground, which is pasture, inclines in a moderate descent for half a mile, and is interspersed with some hillocks, which were rifted, in every direction, as well towards the great woody hanger, as from it. In the first pasture the deep clefts began; and running across the lane, and under the buildings, made such vast shelves that the road was impassable for some time; and so over to an arable field on the other side, which was strangely torn and disordered. The second pasture field, being more soft and springy, was protruded forward without many fissures in the turf, which was raised in long ridges resembling graves, lying at right angles to the motion. At the bottom of this enclosure the soil and turf rose many feet against the bodies of some oaks that obstructed their farther course and terminated this awful commotion.

The perpendicular height of the precipice, in general, is twenty-three yards; the length of the lapse, or slip, as seen from the fields below, one hundred and eighty-one; and a partial fall, concealed in the coppice, extends seventy yards more: so that the total length of this fragment that fell was two hundred and fifty-one yards. About fifty acres of land suffered from this violent convulsion; two houses were entirely destroyed; one end of a new barn was left in ruins, the walls being cracked through the very stones that composed them; a hanging coppice was changed to a naked rock; and some grass grounds and an arable field so broken and rifted by the chasms as to be rendered, for a time, neither fit for the plough or safe for pasturage, till considerable labour and expense had been bestowed in levelling the surface and filling in the gaping fissures.

[1] Sir Richard Baker (1568–1645) was a commoner of Hart Hall, Oxford, in 1584, M.P. for Arundel 1593, and for East Grinstead in 1597. He was knighted by James I

in 1603 ; married in 1620, and accepted responsibility for the heavy debts of his wife's family, with the result that he lost all his estates and died in the Fleet Prison, after writing there a *Chronicle of the Kings of England from the Time of the Romans' Government unto the Death of King James*, which ran through many editions and was a favourite book of Sir Roger de Coverley and his class. In his chronicle of the reign of Queen Elizabeth he says :

" In her thirteenth yeer, a prodigious Earthquake happened in the East parts of *Herefordshire*, at a little town called *Kinnaston*. On the seventeenth of *February* at six of the clock in the evening, the earth began to open, and a hill with a rock under it (making at first a great bellowing noyse, which was heard a great way off) lifted it self up a great heighth and began to travell, bearing along with it the Trees that grew upon it, the Sheep-folds, and Flocks of Sheep abiding there at the same time. In the place from whence it was first moved, it left a gaping distance, forty foot broad and fourscore Ells long ; the whole Field was about twenty Acres. Passing along, it overthrew a Chappell standing in the way, removed an Ewe-tree planted in the Church-yard, from the West into the East ; with the like force it thrust before it Highways, Sheepfolds, Hedges, and Trees, made tilled ground pasture, and again turned Pasture into Tillage. Having walked in this sort from Saturday in the evening, till Monday noon, it then stood still. . . . In her six and twentieth year, being the yeer 1583, the like Prodigie happened in *Dorsetshire*, as in the year 1571 had happened in Herefordshire ; A field of three acres in Blackmore, with the Trees and Fences, moved from its place, and passed over another Field, travelling in the High-way that goeth to *Herne*, and there stayed."

[2] John Philips (1676–1709), one of the earliest of modern English nature poets, wrote " Cyder " in imitation of Virgil's Georgics, giving in it a full account of apple-culture and the making of cider, particularly in Herefordshire. Marcley Hill is the one near Kinnaston described in the above cited chronicle.

LETTER XLVI

TO THE SAME

Selborne.

"— — — resonant arbusta — — — —"

THERE is a steep abrupt pasture field interspersed with furze close to the back of this village, well known by the name of *Short Lithe*, consisting of a rocky dry soil, and inclining to the afternoon sun. This spot abounds with the *gryllus campestris*, or *field-cricket* ; which, though frequent in these parts, is by no means a common insect in many other counties.

As their cheerful summer cry cannot but draw the attention of a naturalist, I have often gone down to examine the œconomy of these *grylli*, and study their mode of life: but they are so shy and cautious that it is no easy matter to get a sight of them; for, feeling a person's footsteps as he advances, they stop short in the midst of their song, and retire backward nimbly into their burrows, where they lurk all till suspicion of danger is over.

At first we [1] attempted to dig them out with a spade, but without any great success; for either we could not get to the bottom of the hole, which often terminated under a great stone; or else, in breaking up the ground, we inadvertently squeezed the poor insect to death. Out of one so bruised we took a multitude of eggs, which were long and narrow, of a yellow colour, and covered with a very tough skin. By this accident we learned to distinguish the male from the female; the former of which is shining black, with a golden stripe across his shoulders; the latter is more dusky, more capacious about the abdomen, and carries a long sword-shaped weapon at her tail, which probably is the instrument with which she deposits her eggs in crannies and safe receptacles.

Where violent methods will not avail, more gentle means will often succeed; and so it proved in the present case; for, though a spade be too boisterous and rough an implement, a pliant stalk of grass, gently insinuated into the caverns, will probe their windings to the bottom, and quickly bring out the inhabitant; and thus the humane inquirer may gratify his curiosity without injuring the object of it. It is remarkable that, though these insects are furnished with long legs behind, and brawny thighs for leaping, like grasshoppers; yet when driven from their holes they shew no activity, but crawl along in a shiftless manner, so as easily to be taken: and again, though provided with a curious apparatus of wings, yet they never exert them when there seems to be the greatest occasion. The males only make that shrilling noise perhaps out of rivalry and emulation, as is the case with many animals which exert some sprightly note during their breeding time: it is raised by a brisk friction of one

wing against the other. They are solitary beings, living singly male or female, each as it may happen; but there must be a time when the sexes have some intercourse, and then the wings may be useful perhaps during the hours of night. When the males meet they will fight fiercely, as I found by some which I put into the crevices of a dry stone wall, where I should have been glad to have made them settle. For though they seemed distressed by being taken out of their knowledge, yet the first that got possession of the chinks would seize on any that were obtruded upon them with a vast row of serrated fangs. With their strong jaws, toothed like the shears of a lobster's claws, they perforate and round their curious regular cells, having no fore-claws to dig, like the mole-cricket. When taken in hand I could not but wonder that they never offered to defend themselves, though armed with such formidable weapons. Of such herbs as grow before the mouths of their burrows they eat indiscriminately; and on a little platform, which they make just by, they drop their dung; and never, in the day time, seem to stir more than two or three inches from home. Sitting in the entrance of their caverns they chirp all night as well as day from the middle of the month of *May* to the middle of *July*; and in hot weather, when they are most vigorous, they make the hills echo; and, in the stiller hours of darkness, may be heard to a considerable distance. In the beginning of the season their notes are more faint and inward; but became louder as the summer advances, and so die away again by degrees.

Sounds do not always give us pleasure according to their sweetness and melody; nor do harsh sounds always displease. We are more apt to be captivated or disgusted with the associations which they promote, than with the notes themselves. Thus the shrilling of the *field-cricket*, though sharp and stridulous, yet marvellously delights some hearers, filling their minds with a train of summer ideas of every thing that is rural, verdurous, and joyous.

About the tenth of *March* the crickets appear at the mouths of their cells, which they then open and bore, and shape very elegantly. All that ever I have seen at that season were in their pupa state, and

had only the rudiments of wings, lying under a skin or coat, which must be cast before the insect can arrive at it's perfect state ; * from whence I should suppose that the old ones of last year do not always survive the winter. In *August* their holes begin to be obliterated, and the insects are seen no more till spring.

Not many summers ago I endeavoured to transplant a colony to the terrace in my garden, by boring deep holes in the sloping turf. The new inhabitants stayed some time, and fed and sung ; but wandered away by degrees, and were heard at a farther distance every morning ; so that it appears that on this emergency they made use of their wings in attempting to return to the spot from which they were taken.

One of these crickets, when confined in a paper cage and set in the sun, and supplied with plants moistened with water, will feed and thrive, and become so merry and loud as to be irksome in the same room where a person is sitting : if the plants are not wetted it will die.

[1] The author's companion on this occasion (May 20th, 1761) was his brother Thomas Holt White, afterwards F.R.S.

LETTER XLVII

TO THE SAME

Selborne.

DEAR SIR,

" Far from all resort of mirth
" Save the cricket on the hearth." MILTON'S *Il Penseroso.*

WHILE many other insects must be sought after in fields and woods, and waters, the *gryllus domesticus*, or *house-cricket*, resides altogether within our dwellings, intruding itself upon our notice whether we

* We have observed that they cast these skins in *April*, which are then seen lying at the mouths of their holes.

will or no. This species delights in new-built houses, being, like the spider, pleased with the moisture of the walls; and besides, the softness of the mortar enables them to burrow and mine between the joints of the bricks or stones, and to open communications from one room to another. They are particularly fond of kitchens and bakers' ovens, on account of their perpetual warmth.

Tender insects that live abroad either enjoy only the short period of one summer, or else doze away the cold uncomfortable months in profound slumbers; but these, residing as it were in a torrid zone, are always alert and merry: a good *Christmas* fire is to them like the heats of the dog-days. Though they are frequently heard by day, yet is their natural time of motion only in the night. As soon as it grows dusk, the chirping increases, and they come running forth, and are from the size of a flea to that of their full stature. As one should suppose, from the burning atmosphere which they inhabit, they are a thirsty race, and show a great propensity for liquids, being found frequently drowned in pans of water, milk, broth, or the like. Whatever is moist they affect: and therefore often gnaw holes in wet woollen stockings and aprons that are hung to the fire: they are the housewife's barometer, foretelling her when it will rain; and are prognostic sometimes, she thinks, of ill or good luck; of the death of a near relation, or the approach of an absent lover. By being the constant companions of her solitary hours they naturally become the objects of her superstition. These crickets are not only very thirsty, but very voracious; for they will eat the scummings of pots, and yeast, salt, and crumbs of bread; and any kitchen offal or sweepings. In the summer we have observed them to fly, when it became dusk, out of the windows, and over the neighbouring roofs. This feat of activity accounts for the sudden manner in which they often leave their haunts, as it does for the method by which they come to houses where they were not known before. It is remarkable, that many sorts of insects seem never to use their wings but when they have a mind to shift their quarters and settle new colonies. When in the air they move "*volatu undoso*," in waves or curves,

like *wood-peckers*, opening and shutting their wings at every stroke, and so are always rising or sinking.

When they increase to a great degree, as they did once in the house where I am now writing, they become noisome pests, flying into the candles, and dashing into people's faces; but may be blasted and destroyed by gunpowder discharged into their crevices and crannies. In families, at such times, they are, like Pharaoh's plague of frogs,—" in their bed-chambers, and upon their beds, and in " their ovens, and in their kneading-troughs ". * Their shrilling noise is occasioned by a brisk attrition of their wings. Cats catch hearth-crickets, and, playing with them as they do with mice, devour them. Crickets may be destroyed, like wasps, by phials half filled with beer, or any liquid, and set in their haunts; for, being always eager to drink, they will crowd in till the bottles are full.

LETTER XLVIII

TO THE SAME

Selborne.

How diversified are the modes of life not only of incongruous but even of congenerous animals; and yet their specific distinctions are not more various than their propensities. Thus, while the *field-cricket* delights in sunny dry banks, and the *house-cricket* rejoices amidst the glowing heat of the kitchen hearth or oven, the *gryllus gryllo talpa* (the *mole-cricket*) haunts moist meadows, and frequents the sides of ponds and banks of streams, performing all it's functions in a swampy wet soil. With a pair of fore-feet, curiously adapted to the purpose, it burrows and works under ground like the mole, raising a ridge as it proceeds, but seldom throwing up hillocks.

As *mole-crickets* often infest gardens by the side of canals, they are unwelcome guests to the gardener, raising up ridges in their

* Exod. viii. 3.

subterraneous progress, and rendering the walks unsightly. If they take to the kitchen quarters, they occasion great damage among the plants and roots, by destroying whole beds of cabbages, young legumes, and flowers. When dug out they seem very slow and helpless, and make no use of their wings by day; but at night they come abroad, and make long excursions, as I have been convinced by finding stragglers, in a morning, in improbable places. In fine weather, about the middle of *April*, and just at the close of day, they begin to solace themselves with a low, dull, jarring note, continued for a long time without interruption, and not unlike the chattering of the fern-owl, or goat-sucker, but more inward.

About the beginning of *May* they lay their eggs, as I was once an eye-witness: for a gardener at an house, where I was on a visit, happening to be mowing, on the 6th of that month, by the side of a canal, his scythe struck too deep, pared off a large piece of turf, and laid open to view a curious scene of domestic œconomy:

"— — — — ingentem lato dedit ore fenestram:
"Apparent domus intus, et atria longa patescunt:
"Apparent — — — penetralia."

There were many caverns and winding passages leading to a kind of chamber, neatly smoothed and rounded, and about the size of a moderate snuff-box. Within this secret nursery were deposited near an hundred eggs of a dirty yellow colour, and enveloped in a tough skin, but too lately excluded to contain any rudiments of young, being full of a viscous substance. The eggs lay but shallow, and within the influence of the sun, just under a little heap of fresh-moved mould, like that which is raised by ants.

When *mole-crickets* fly they move "*cursu undoso*," rising and falling in curves, like the other species mentioned before. In different parts of this kingdom people call them *fen-crickets*, *churr-worms*, and *eve-churrs*, all very apposite names.

Anatomists, who have examined the intestines of these insects, astonish me with their accounts; for they say that, from the structure,

position, and number of their stomachs, or maws, there seems to be good reason to suppose that this and the two former species *ruminate* or *chew* the *cud* like many quadrupeds ![1]

[1] The stomach is complex, but not really parallel to a ruminant's ; they do not chew the cud.

LETTER XLIX

TO THE SAME

Selborne, *May* 7, 1779.

It is now more than forty years that I have paid some attention to the ornithology of this district, without being able to exhaust the subject : new occurrences still arise as long as any inquiries are kept alive.

In the last week of last month five of those most rare birds, too uncommon to have obtained an *English* name,[1] but known to naturalists by the terms of *himantopus*, or *loripes*, and *charadrius himantopus*, were shot upon the verge of *Frinsham-pond*, a large lake belonging to the bishop of *Winchester*, and lying between *Woolmer-forest*, and the town of *Farnham*, in the county of *Surrey*. The pond keeper says there were three brace in the flock ; but that, after he had satisfied his curiosity, he suffered the sixth to remain unmolested. One of these specimens I procured, and found the length of the legs to be so extraordinary, that, at first sight, one might have supposed the shanks had been fastened on to impose on the credulity of the beholder : they were legs in *caricatura* ; and had we seen such proportions on a *Chinese* or *Japan* screen we should have made large allowances for the fancy of the draughtsman. These birds are of the *plover* family, and might with propriety be called the *stilt plovers*. *Brisson*,[2] under that idea, gives them the apposite name of *l'échasse*. My specimen, when drawn and stuffed with pepper, weighed only four ounces and a quarter, though the *naked* part of the thigh measured three inches and an half, and the legs four inches

and an half. Hence we may safely assert that these birds exhibit, weight for inches, incomparably the greatest length of legs of any known bird. The *flamingo*, for instance, is one of the most long legged birds, and yet it bears no manner of proportion to the *himantopus*; for a cock *flamingo* weighs, at an average, about four pounds avoirdupois; and his legs and thighs measure usually about twenty inches. But four pounds are fifteen times and a fraction more than four ounces and one quarter; and if four ounces and a quarter have eight inches of legs, four pounds must have one hundred and twenty inches and a fraction of legs; *viz.* somewhat more than ten feet; such a monstrous proportion as the world never saw![3] If you should try the experiment in still larger birds the disparity would still increase. It must be matter of great curiosity to see the *stilt plover* move; to observe how it can wield such a length of lever with such feeble muscles as the thighs seem to be furnished with. At best one should expect it to be but a bad walker: but what adds to the wonder is that it has no back toe. Now without that steady prop to support it's steps it must be liable, in speculation, to perpetual vacillations, and seldom able to preserve the true center of gravity.

The old name of *himantopus* is taken from *Pliny*; and, by an aukward metaphor, implies that the legs are as slender and pliant as if cut out of a *thong* of leather. Neither *Willughby* nor *Ray*, in all their curious researches, either at home or abroad, ever saw this bird. Mr. *Pennant* never met with it in all *Great-Britain*, but observed it often in the cabinets of the curious at *Paris*. *Hasselquist* says that it migrates to *Egypt* in the autumn: and a most accurate observer of Nature has assured me that he has found it on the banks of the streams in *Andalusia*.

Our writers record it to have been found only twice in *Great-Britain*.[4] From all these relations it plainly appears that these long legged *plovers* are birds of *South Europe*, and rarely visit our island; and when they do are wanderers and stragglers, and impelled to make so distant and northern an excursion from motives or accidents for which we are not able to account. One thing may fairly be deduced,

that these birds come over to us from the continent, since nobody can suppose that a species not noticed once in an age, and of such a remarkable make, can constantly breed unobserved in this kingdom.

[1] Now known as Black-winged Stilts.

[2] Mathurin-Jacques Brisson (1723–1806) was a disciple of Reaumur and a tutor in the royal family of France. He published in 1760 an *Ornithologie* describing 1,500 species of birds. Several of his scientific names, like Carduelis for the goldfinch, Pyrrhula for the bullfinch, and Vanellus for the lapwing, hold their place even now.

[3] But this is a fallacy ; the proportion ought to vary according to the cube root of the weight, and not directly.

[4] Although the Black-winged Stilt is only a vagrant in the British Isles there are many subsequent records of its occurrence, Norfolk alone having seventeen.

LETTER L

TO THE SAME

Selborne, *April* 21, 1780.

Dear Sir,

The old *Sussex* tortoise,[1] that I have mentioned to you so often, is become my property. I dug it out of it's winter dormitory in *March* last, when it was enough wakened to express it's resentments by hissing ; and, packing it in a box with earth, carried it eighty miles in post-chaises. The rattle and hurry of the journey so perfectly roused it that, when I turned it out on a border, it walked twice down to the bottom of my garden ; however, in the evening, the weather being cold, it buried itself in the loose mould, and continues still concealed.

As it will be under my eye, I shall now have an opportunity of enlarging my observations on it's mode of life, and propensities ; and perceive already that, towards the time of coming forth, it opens a breathing place in the ground near it's head, requiring, I conclude, a freer respiration, as it becomes more alive. This creature not only goes under the earth from the middle of *November* to the middle of *April*, but sleeps great part of the summer ; for it goes to bed in the longest days at four in the afternoon, and often does not stir in the

morning till late. Besides, it retires to rest for every shower; and does not move at all in wet days.

When one reflects on the state of this strange being, it is a matter of wonder to find that Providence should bestow such a profusion of days, such a seeming waste of longevity, on a reptile that appears to relish it so little as to squander more than two thirds of it's existence in a joyless stupor, and be lost to all sensation for months together in the profoundest of slumbers.

Because we call this creature an abject reptile, we are too apt to undervalue his abilities, and depreciate his powers of instinct. Yet he is, as Mr. *Pope* says of his lord,

"— — — Much too wise to walk into a well:"

and has so much discernment as not to fall down an haha; but to stop and withdraw from the brink with the readiest precaution.

Though he loves warm weather he avoids the hot sun; because his thick shell, when once heated, would, as the poet says of solid armour—"scald with safety". He therefore spends the more sultry hours under the umbrella of a large cabbage-leaf, or amidst the waving forests of an asparagus-bed.

But as he avoids heat in the summer, so, in the decline of the year, he improves the faint autumnal beams, by getting within the reflection of a fruit wall: and, though he never has read that planes inclining to the horizon receive a greater share of warmth,* he inclines his shell, by tilting it against the wall, to collect and admit every feeble ray.

Pitiable seems the condition of this poor embarrassed reptile: to be cased in a suit of ponderous armour, which he cannot lay aside; to be imprisoned, as it were, within his own shell, must preclude, we should suppose, all activity and disposition for enterprize. Yet

* Several years ago a book was written entitled "Fruit-walls improved by inclining them to the horizon": in which the author has shewn, by calculation, that a much greater number of the rays of the sun will fall on such walls than on those which are perpendicular.

there is a season of the year (usually the beginning of June) when his exertions are remarkable. He then walks on tiptoe, and is stirring by five in the morning; and, traversing the garden, examines every wicket and interstice in the fences, through which he will escape if possible: and often has eluded the care of the gardener, and wandered to some distant field. The motives that impel him to undertake these rambles seem to be of the amorous kind: his fancy then becomes intent on sexual attachments, which transport him beyond his usual gravity, and induce him to forget for a time his ordinary solemn deportment.

While I was writing this letter, a moist and warm afternoon, with the thermometer at 50, brought forth troops of *shell-snails*; and, at the same juncture, the *tortoise* heaved up the mould, and put out it's head; and the next morning came forth, as it were raised from the dead; and walked about till four in the afternoon. This was a curious coincidence! a very amusing occurrence! to see such a similarity of feelings between the two φερεοικει! for so the *Greeks* call both the *shell-snail* and the *tortoise*.

Summer birds are, this cold and backward spring, unusually late: I have seen but one swallow yet. This conformity with the weather convinces me more and more that they sleep in the winter.

[1] The shell of this tortoise, whose name was Timothy, is preserved in the British Museum, where it has been identified as a specimen of *Testudo ibera* (Pallas). The date on which it was dug out, ascertained from the *Naturalist's Journal*, was March 17th.

LETTER LI

TO THE SAME

Selborne, *Sept.* 3, 1781.

I HAVE now read your miscellanies through with much care and satisfaction; and am to return you my best thanks for the honourable mention [1] made in them of me as a naturalist, which I wish I may deserve.

In some former letters I expressed my suspicions that many of the house-martins do not depart in the winter far from this village. I therefore determined to make some search about the south-east end of the hill, where I imagined they might slumber out the uncomfortable months of winter. But supposing that the examination would be made to the best advantage in the spring, and observing that no martins had appeared by the 11th of *April* last; on that day I employed some men to explore the shrubs and cavities of the suspected spot. The persons took pains, but without any success: however, a remarkable incident occurred in the midst of our pursuit —while the labourers were at work a house-martin, the first that had been seen this year, came down the village in the sight of several people, and went at once into a nest, where it stayed a short time, and then flew over the houses; for some days after no martins were observed, not till the 16th of *April*, and then only a pair. Martins in general were remarkably late this year.

[1] The author is referred to in the Miscellanies as "not only a well-read naturalist, but an active sportsman", which he had long ceased to be; also as "that ingenious and observant naturalist", and "my often-mentioned correspondent".

LETTER LII

TO THE SAME

Selborne, *Sept.* 9, 1781.

I HAVE just met with a circumstance respecting swifts, which furnishes an exception to the whole tenor of my observations ever since I have bestowed any attention on that species of hirundines. Our swifts, in general, withdrew this year about the first day of *August*, all save one pair, which in two or three days was reduced to a single bird. The perseverance of this individual made me suspect that the strongest of motives, that of an attachment to her young, could alone occasion so late a stay. I watched therefore till the twenty-fourth of *August*, and then discovered that, under the eaves of the church, she attended

upon two young, which were fledged, and now put out their white chins from a crevice. These remained till the twenty-seventh, looking more alert every day, and seeming to long to be on the wing. After this day they were missing at once; nor could I ever observe them with their dam coursing round the church in the act of learning to fly, as the first broods evidently do. On the thirty-first I caused the eaves to be searched, but we found in the nest only two callow, dead, stinking swifts, on which a second nest had been formed. This double nest was full of the black shining cases of the *hippoboscæ hirundis*.[1]

The following remarks on this unusual incident are obvious. The first is, that though it may be disagreeable to swifts to remain beyond the beginning of *August*, yet that they can subsist longer is undeniable. The second is, that this uncommon event, as it was owing to the loss of the first brood, so it corroborates my former remark, that swifts breed regularly but once; since, was the contrary the case, the occurrence above could neither be new nor rare.

P.S. One swift was seen at *Lyndon*,[2] in the county of *Rutland*, in 1782, so late as the third of *September*.

[1] *Stenopteryx hirundinis* (L.).

[2] Where the author's brother-in-law Thomas Barker lived; the *Naturalist's Journal* adds: "In all our observations Mr. Barker and I never saw or heard of a Swift in September, though we have remarked them for nearly forty years."

LETTER LIII

TO THE SAME

As I have sometimes known you make inquiries about several kinds of insects, I shall here send you an account of one sort which I little expected to have found in this kingdom. I had often observed that one particular part of a vine growing on the walls of my house was covered in the autumn with a black dust-like appearance, on which the flies fed eagerly; and that the shoots and leaves thus affected

did not thrive; nor did the fruit ripen. To this substance I applied my glasses; but could not discover that it had any thing to do with animal life, as I at first expected: but, upon a closer examination behind the larger boughs, we were surprised to find that they were coated over with husky shells, from whose sides proceeded a cotton-like substance, surrounding a multitude of eggs. This curious and uncommon production put me upon recollecting what I have heard and read concerning the *coccus vitis viniferæ* [1] of *Linnæus*, which, in the south of *Europe*, infests many vines, and is an horrid and loathsome pest. As soon as I had turned to the accounts given of this insect, I saw at once that it swarmed on my vine; and did not appear to have been at all checked by the preceding winter, which had been uncommonly severe.

Not being then at all aware that it had any thing to do with *England*, I was much inclined to think that it came from *Gibraltar* among the many boxes and packages of plants and birds which I had formerly received from thence; and especially as the vine infested grew immediately under my study-window, where I usually kept my specimens. True it is that I had received nothing from thence for some years: but as insects, we know, are conveyed from one country to another in a very unexpected manner, and have a wonderful power of maintaining their existence till they fall into a *nidus* proper for their support and increase, I cannot but suspect still that these *cocci* came to me originally from *Andalusia*. Yet, all the while, candour obliges me to confess that Mr. *Lightfoot* [2] has written me word that he once, and but once, saw these insects on a vine at *Weymouth* in *Dorsetshire*; which, it is here to be observed, is a sea-port town to which the *coccus* might be conveyed by shipping.

As many of my readers may possibly never have heard of this strange and unusual insect, I shall here transcribe a passage from a natural history of *Gibraltar*, written by the Reverend *John White*, late vicar of *Blackburn* in *Lancashire*, but not yet published:—

"In the year 1770, a vine, which grew on the east-side of my "house, and which had produced the finest crops of grapes for

" years past, was suddenly overspread on all the woody branches " with large lumps of a white fibrous substance resembling spiders' " webs, or rather raw cotton. It was of a very clammy quality, " sticking fast to every thing that touched it, and capable of being " spun into long threads. At first I suspected it to be the product " of spiders, but could find none. Nothing was to be seen con- " nected with it but many *brown oval husky shells*, which by no means " looked like insects, but rather resembled bits of the dry bark of " the vine. The tree had a plentiful crop of grapes set, when this " pest appeared upon it; but the fruit was manifestly injured by " this foul incumbrance. It remained all the summer, still increasing, " and loaded the woody and bearing branches to a vast degree. I " often pulled off great quantities by handfuls; but it was so slimy " and tenacious that it could by no means be cleared. The grapes " never filled to their natural perfection, but turned watery and " vapid. Upon perusing the works afterwards of M. de *Réaumur*, " I found this matter perfectly described and accounted for. Those " husky shells, which I had observed, were no other than the *female* " *coccus*, from whose sides this cotton-like substance exsudes, and " serves as a covering and security for their eggs."

To this account I think proper to add, that, though the female *cocci* are stationary, and seldom remove from the place to which they stick, yet the male is a winged insect; and that the black dust which I saw was undoubtedly the excrement of the females, which is eaten by ants as well as flies. Though the utmost severity of our winter did not destroy these insects, yet the attention of the gardener in a summer or two has entirely relieved my vine from this filthy annoyance.

As we have remarked above that insects are often conveyed from one country to another in a very unaccountable manner, I shall here mention an emigration of small *aphides*, which was observed in the village of *Selborne* no longer ago than *August* the 1st, 1785.

At about three o'clock in the afternoon of that day, which was

very hot, the people of this village were surprised by a shower of *aphides*, or *smother-flies*, which fell in these parts. Those that were walking in the street at that juncture found themselves covered with these insects, which settled also on the hedges and gardens, blackening all the vegetables where they alighted. My annuals were discoloured with them, and the stalks of a bed of onions were quite coated over for six days after. These armies were then, no doubt, in a state of emigration, and shifting their quarters ; and might have come, as far as we know, from the great hop-plantations of *Kent* or *Sussex*, the wind being all that day in the easterly quarter. They were observed at the same time in great clouds about *Farnham*, and all along the vale from *Farnham* to *Alton*.*

[1] *Pulvinaria vitis* (L.), a close relative of the cochineal beetle.

[2] John Lightfoot, F.R.S. (1735–88), an original Fellow of the Linnæan Society, accompanied Pennant in 1772 on a tour through Scotland and the Hebrides which led to his *Flora Scotica*. He was the first naturalist to distinguish the reed-warbler, of which he published a description in 1785. His herbarium is at Kew.

LETTER LIV

TO THE SAME

Dear Sir,

When I happen to visit a family where *gold* and *silver fishes* are kept in a glass bowl, I am always pleased with the occurrence, because it offers me an opportunity of observing the actions and propensities of those beings with whom we can be little acquainted in their natural state. Not long since I spent a fortnight at the house of a friend where there was such a *vivary*, to which I paid no small attention, taking every occasion to remark what passed within it's narrow limits. It was here that I first observed the manner in which fishes die. As soon as the creature sickens, the head sinks lower and

* For various methods by which several insects shift their quarters, see *Derham's* Physico-Theology.

lower, and it stands as it were on it's head; till, getting weaker, and losing all poise, the tail turns over, and at last it floats on the surface of the water with it's belly uppermost. The reason why fishes, when dead, swim in that manner is very obvious; because, when the body is no longer balanced by the fins of the belly, the broad muscular back preponderates by it's own gravity, and turns the belly uppermost, as lighter from it's being a cavity, and because it contains the swimming-bladders, which contribute to render it buoyant. Some that delight in *gold* and *silver fishes* have adopted a notion that they need no aliment. True it is that they will subsist for a long time without any apparent food but what they can collect from pure water frequently changed: yet they must draw some support from animalcula, and other nourishment supplied by the water; because, though they seem to eat nothing, yet the consequences of eating often drop from them. That they are best pleased with such *jejune* diet may easily be confuted, since if you toss them crumbs they will seize them with great readiness, not to say greediness: however, bread should be given sparingly, lest, turning sour, it corrupt the water. They will also feed on the water-plant called *lemna* (*duck's meat*), and also on small fry.

When they want to move a little they gently protrude themselves with their *pinnæ pectorales* [1]; but it is with their strong muscular tails only that they and all fishes shoot along with such inconceivable rapidity. It has been said that the eyes of fishes are immoveable: but these apparently turn them forward or backward in their sockets as their occasions require. They take little notice of a lighted candle, though applied close to their heads, but flounce and seem much frightened by a sudden stroke of the hand against the support whereon the bowl is hung; especially when they have been motionless, and are perhaps asleep. As fishes have no eyelids, it is not easy to discern when they are sleeping or not, because their eyes are always open.

Nothing can be more amusing than a glass bowl containing such fishes: the double refractions of the glass and water represent them, when moving, in a shifting and changeable variety of dimen-

sions, shades, and colours; while the two mediums, assisted by the concavo-convex shape of the vessel, magnify and distort them vastly; not to mention that the introduction of another element and it's inhabitants into our parlours engages the fancy in a very agreeable manner.

Gold and *silver fishes*, though originally natives of *China* and *Japan*, yet are become so well reconciled to our climate as to thrive and multiply very fast in our ponds and stews. *Linnæus* ranks this species of fish under the genus of *cyprinus*, or *carp*, and calls it *cyprinus auratus*.

Some people exhibit this sort of fish in a very fanciful way; for they cause a glass bowl to be blown with a large hollow space within, that does not communicate with it. In this cavity they put a bird occasionally; so that you may see a goldfinch or a linnet hopping as it were in the midst of the water, and the fishes swimming in a circle round it. The simple exhibition of the fishes is agreeable and pleasant; but in so complicated a way becomes whimsical and unnatural, and liable to the objection due to him,

"Qui variare cupit rem prodigialitèr unam."

I am, &c.

[1] Pectoral fins: those of the breast.

LETTER LV

TO THE SAME

October 10, 1781.

DEAR SIR,

I THINK I have observed before that much the most considerable part of the *house-martins* withdraw from hence about the first week in *October*; but that some, the latter broods I am now convinced, linger on till towards the middle of that month: and that at times,

once perhaps in two or three years, a flight, for one day only, has shown itself in the first week of *November*.

Having taken notice, in *October* 1780, that the last flight was numerous, amounting perhaps to one hundred and fifty; and that the season was soft and still; I was resolved to pay uncommon attention to these late birds; to find, if possible, where they roosted, and to determine the precise time of their retreat. The mode of life of these latter *hirundines* is very favourable to such a design; for they spend the whole day in the sheltered district, between me and the *Hanger*, sailing about in a placid, easy manner, and feasting on those insects which love to haunt a spot so secure from ruffling winds. As my principal object was to discover the place of their roosting, I took care to wait on them before they retired to rest, and was much pleased to find that, for several evenings together, just at a quarter past five in the afternoon, they all scudded away in great haste towards the south-east, and darted down among the low shrubs above the cottages at the end of the hill. This spot in many respects seems to be well calculated for their winter residence: for in many parts it is as steep as the roof of any house, and therefore secure from the annoyances of water; and it is moreover clothed with beechen shrubs, which, being stunted and bitten by sheep, make the thickest covert imaginable; and are so entangled as to be impervious to the smallest spaniel: besides, it is the nature of underwood beech never to cast it's leaf all the winter; so that, with the leaves on the ground and those on the twigs, no shelter can be more complete. I watched them on to the thirteenth and fourteenth of *October*, and found their evening retreat was exact and uniform; but after this they made no regular appearance. Now and then a straggler was seen; and, on the twenty-second of *October*, I observed two in the morning over the village, and with them my remarks for the season ended.

From all these circumstances put together, it is more than probable that this lingering flight, at so late a season of the year, never departed from the island. Had they indulged me that autumn

with a *November* visit, as I much desired, I presume that, with proper assistants, I should have settled the matter past all doubt; but though the third of *November* was a sweet day, and in appearance exactly suited to my wishes, yet not a martin was to be seen; and so I was forced, reluctantly, to give up the pursuit.

I have only to add that were the bushes, which cover some acres, and are not my own property, to be grubbed and carefully examined, probably those late broods, and perhaps the whole aggregate body of the house-martins of this district, might be found there, in different secret dormitories; and that, so far from withdrawing into warmer climes, it would appear that they never depart three hundred yards from the village.

LETTER LVI

TO THE SAME

THEY who write on natural history cannot too frequently advert to *instinct*, that wonderful limited faculty, which, in some instances, raises the brute creation as it were above *reason*, and in others leaves them so far below it. Philosophers have defined *instinct* to be that secret influence by which every species is impelled naturally to pursue, at all times, the same way or track, without any teaching or example; whereas *reason*, without instruction, would often vary and do that by many methods which *instinct* effects by one alone. Now this maxim must be taken in a qualified sense; for there are instances in which *instinct* does vary and conform to the circumstances of place and convenience.

It has been remarked that every species of bird has a mode of nidification peculiar to itself; so that a school-boy would at once pronounce on the sort of nest before him. This is the case among fields and woods, and wilds; but, in the villages round *London*, where mosses and gossamer, and cotton from vegetables, are hardly to be found, the nest of the *chaffinch* has not that elegant finished

appearance, nor is it so beautifully studded with lichens, as in a more rural district: and the *wren* is obliged to construct it's house with straws and dry grasses, which do not give it that rotundity and compactness so remarkable in the edifices of that little architect. Again, the regular nest of the *house-martin* is hemispheric; but where a rafter, or a joist, or a cornice, may happen to stand in the way, the nest is so contrived as to conform to the obstruction, and becomes flat or oval, or compressed.

In the following instances *instinct* is perfectly uniform and consistent. There are three creatures, the *squirrel*, the *field-mouse*, and the bird called the *nut-hatch* (*sitta Europeæa*), which live much on hazel-nuts; and yet they open them each in a different way. The first, after rasping off the small end, splits the shell in two with his long fore-teeth, as a man does with his knife; the second nibbles a hole with his teeth, so regular as if drilled with a wimble,[1] and yet so small that one would wonder how the kernel can be extracted through it; while the last picks an irregular ragged hole with it's bill: but as this artist has no paws to hold the nut firm while he pierces it, like an adroit workman, he fixes it, as it were in a vice, in some cleft of a tree, or in some crevice; when, standing over it, he perforates the stubborn shell. We have often placed nuts in the chink of a gate-post where *nut-hatches* have been known to haunt, and have always found that those birds have readily penetrated them. While at work they make a rapping noise that may be heard at a considerable distance.

You that understand both the theory and practical part of music may best inform us why *harmony* or *melody* should so strangely affect some men, as it were by recollection, for days after a concert is over. What I mean the following passage will most readily explain:

"Præhabebat porrò vocibus humanis, instrumentisque har-
" monicis musicam illam avium: non quod aliâ quoque non delec-
" taretur; sed quod ex musicâ humanâ relinqueretur in animo
" continens quædam, attentionemque et somnum conturbans agitatio;

" dum ascensus, exscensus, tenores, ac mutationes illæ sonorum, " et consonantiarum euntque, redeuntque per phantasiam :—cum " nihil tale relinqui possit ex modulationibus avium, quæ, quod " non sunt perinde a nobis imitabiles, non possunt perinde internam " facultatem commovere."

Gassendus in Vitâ Peireskii.[2]

This curious quotation strikes me much by so well representing my own case, and by describing what I have so often felt, but never could so well express. When I hear fine music I am haunted with passages therefrom night and day ; and especially at first waking, which, by their importunity, give me more uneasiness than pleasure : elegant lessons still tease my imagination, and recur irresistibly to my recollection at seasons, and even when I am desirous of thinking of more serious matters.

I am, &c.

[1] A gimlet or auger.

[2] " Moreover he preferred the music of birds to human voices, and to musical instruments ; not that those also failed to give him pleasure, but because human music left in the mind a certain agitation, seizing the attention and disturbing repose, while it goes to and fro, up and down the scale in reverie with changing pitch and interval—while no such impression could be left by the warbling of birds, which, because we cannot equally imitate them, are incapable of so exciting our minds."

LETTER LVII

TO THE SAME

A RARE, and I think a new, little bird frequents my garden, which I have great reason to think is the *pettichaps* : [1] it is common in some parts of the kingdom ; and I have received formerly several dead specimens from *Gibraltar*. This bird much resembles the *white-throat*, but has a more white or rather silvery breast and belly ; is restless and active, like the *willow-wrens*, and hops from bough to bough, examining every part for food ; it also runs up the stems of the *crown-imperials*, and, putting it's head into the bells of those

flowers, sips the liquor which stands in the *nectarium* of each petal. Sometimes it feeds on the ground, like the *hedge-sparrow*, by hopping about on the grass-plots and mown walks.

One of my neighbours, an intelligent and observing man, informs me that, in the beginning of *May*, and about ten minutes before eight o'clock in the evening, he discovered a great cluster of *house-swallows*, thirty at least he supposes, perching on a willow that hung over the verge of *James Knight's* upper-pond. His attention was first drawn by the twittering of these birds, which sat motionless in a row on the bough, with their heads all one way, and, by their weight, pressing down the twig so that it nearly touched the water. In this situation he watched them till he could see no longer. Repeated accounts of this sort, spring and fall, induce us greatly to suspect that *house-swallows* have some strong attachment to water, independent of the matter of food; and, though they may not retire into that element, yet they may conceal themselves in the banks of pools and rivers during the uncomfortable months of winter.

One of the keepers of *Woolmer-forest* sent me a *peregrine-falcon*, which he shot on the verge of that district as it was devouring a wood-pigeon. The *falco peregrinus*, or *haggard falcon*, is a noble species of hawk seldom seen in the southern counties. In winter 1767 [2] one was killed in the neighbouring parish of *Faringdon*, and sent by me to Mr. *Pennant* into *North-Wales*.* Since that time I have met with none till now. The specimen mentioned above was in fine preservation, and not injured by the shot: it measured forty-two inches from wing to wing, and twenty-one from beak to tail, and weighed two pounds and an half standing weight. This species is very robust, and wonderfully formed for rapine: it's breast was plump and muscular; it's thighs long, thick, and brawny; and it's legs remarkably short and well set: the feet were armed with most formidable, sharp, long talons: the eyelids and cere of the bill were yellow; but the irides of the eye dusky; the beak

* See my tenth and eleventh letter to that gentleman.

was thick and hooked, and of a dark colour, and had a jagged process near the end of the upper mandible on each side: it's tail, or train, was short in proportion to the bulk of it's body: yet the wings, when closed, did not extend to the end of the train. From it's large and fair proportions it might be supposed to have been a female; but I was not permitted to cut open the specimen. For one of the birds of prey, which are usually lean, this was in high case: in it's craw were many barley-corns, which probably came from the crop of the wood-pigeon, on which it was feeding when shot: for voracious birds do not eat grain; but, when devouring their quarry, with undistinguishing vehemence swallow bones and feathers, and all matters, indiscriminately. This falcon was probably driven from the mountains of *North Wales* or *Scotland*, where they are known to breed, by rigorous weather and deep snows that had lately fallen.

I am, &c.

[1] The lesser whitethroat, now a fairly common summer visitor to Selborne and to England generally. The country name pettichaps is applied to several warblers indiscriminately.

[2] 1766 according to private correspondence—a more likely date since by August 1767 this bird is already mentioned in letter X to Pennant. The peregrine falcon used to breed on all suitable cliff-faces along the south coast; both then and now an occupied eyry could be seen within forty miles of Selborne. It is nevertheless most numerous in the west and north.

LETTER LVIII

TO THE SAME

My near neighbour [1], a young gentleman in the service of the *East India* Company, has brought home a dog and a bitch of the *Chinese* breed from *Canton*; such as are fattened in that country for the purpose of being eaten: they are about the size of a moderate spaniel; of a pale yellow colour, with coarse bristling hairs on their backs; sharp upright ears, and peaked heads, which give them a very fox-like appearance. Their hind legs are unusually straight, without any bend at the hock or ham, to such a degree as to give them an

aukward gait when they trot. When they are in motion their tails are curved high over their backs like those of some hounds, and have a bare place each on the outside from the tip midway, that does not seem to be matter of accident, but somewhat singular. Their eyes are jet-black, small, and piercing; the insides of their lips and mouths of the same colour, and their tongues blue. The bitch has a dew-claw on each hind leg; the dog has none. When taken out into a field the bitch showed some disposition for hunting, and dwelt on the scent of a covey of partridges till she sprung them, giving her tongue all the time. The dogs in *South America* are dumb; but these bark much in a short thick manner, like foxes; and have a surly, savage demeanour like their ancestors, which are not domesticated, but bred up in sties, where they are fed for the table with rice-meal and other farinaceous food. These dogs, having been taken on board as soon as weaned, could not learn much from their dam; yet they did not relish flesh when they came to *England*. In the islands of the *pacific* ocean the dogs are bred up on vegetables, and would not eat flesh when offered them by our circumnavigators.

We believe that all dogs, in a state of nature, have sharp, upright fox-like ears; and that hanging ears, which are esteemed so graceful, are the effect of choice breeding and cultivation. Thus, in the Travels of *Ysbrandt Ides* [2] from *Muscovy* to *China*, the dogs which draw the *Tartars* on snow-sledges near the river *Oby* are engraved with prick-ears, like those from *Canton*. The *Kamschatdales* also train the same sort of sharp-eared peaked-nosed dogs to draw their sledges; as may be seen in an elegant print engraved for Captain *Cook's* last voyage round the world.

Now we are upon the subject of dogs it may not be impertinent to add, that spaniels, as all sportsmen know, though they hunt partridges and pheasants as it were by instinct, and with much delight and alacrity, yet will hardly touch their bones when offered as food; nor will a mongrel dog of my own, though he is remarkable for finding that sort of game. But, when we came to offer the bones

of partridges to the two *Chinese* dogs, they devoured them with much greediness, and licked the platter clean.

No sporting dogs will flush woodcocks till inured to the scent and trained to the sport, which they then pursue with vehemence and transport; but then they will not touch their bones, but turn from them with abhorrence, even when they are hungry.

Now, that dogs should not be fond of the bones of such birds as they are not disposed to hunt is no wonder; but why they reject and do not care to eat their natural game is not so easily accounted for, since the end of hunting seems to be, that the chase pursued should be eaten. Dogs again will not devour the more rancid water-fowls, nor indeed the bones of any wild-fowls; nor will they touch the fœtid bodies of birds that feed on offal and garbage: and indeed there may be somewhat of providential instinct in this circumstance of dislike; for vultures,* and kites, and ravens, and crows, &c. were intended to be messmates with dogs † over their carrion; and seem to be appointed by Nature as fellow-scavengers to remove all cadaverous nuisances from the face of the earth.

I am, &c.

[1] Charles Etty, son of the Rev. Andrew Etty, vicar of Selborne 1758–4. He went out via Bombay in March 1785, a year after his father's death, and returned in May 1787.

[2] Isbrand Ides of Holstein was sent to Peking in 1692 by Peter the Great, in order to improve the profitable but precarious trade with China. He secured a concession for the sending of whole caravans, in place of isolated enterprises.

LETTER LIX

TO THE SAME

THE fossil wood buried in the bogs of *Wolmer-forest* is not yet all exhausted; for the peat-cutters now and then stumble upon a log.

* *Hasselquist*, in his Travels to the *Levant*, observes that the dogs and vultures at *Grand Cairo* maintain such a friendly intercourse as to bring up their young together in the same place.

† The *Chinese* word for a dog to an *European* ear sounds like *quihloh*.

I have just seen a piece which was sent by a labourer of *Oakhanger* to a carpenter of this village; this was the but-end of a small oak, about five feet long, and about five inches in diameter. It had apparently been severed from the ground by an axe, was very ponderous, and as black as ebony. Upon asking the carpenter for what purpose he had procured it; he told me that it was to be sent to his brother, a joiner at *Farnham*, who was to make use of it in cabinet work, by inlaying it along with whiter woods.

Those that are much abroad on evenings after it is dark, in spring and summer, frequently hear a nocturnal bird passing by on the wing, and repeating often a short quick note. This bird I have remarked myself, but never could make out till lately. I am assured now that it is the *Stone-curlew* (*charadrius oedicnemus*). Some of them pass over or near my house almost every evening [1] after it is dark, from the uplands of the hill and *North field*, away down towards *Dorton*; where, among the streams and meadows, they find a greater plenty of food. Birds that fly by night are obliged to be noisy; their notes often repeated become signals or watch-words to keep them together, that they may not stray or lose each the other in the dark.

The evening proceedings and manœuvres of the rooks are curious and amusing in the autumn. Just before dusk they return in long strings from the foraging of the day, and rendezvous by thousands over *Selborne-down*, where they wheel round in the air, and sport and dive in a playful manner, all the while exerting their voices, and making a loud cawing, which, being blended and softened by the distance that we at the village are below them, becomes a confused noise or chiding; or rather a pleasing murmur, very engaging to the imagination, and not unlike the cry of a pack of hounds in hollow, echoing woods, or the rushing of the wind in tall trees, or the tumbling of the tide upon a pebbly shore. When this ceremony is over, with the last gleam of day, they retire for the night to the deep beechen woods of *Tisted* and *Ropley*. We remember a little girl who, as she was going to bed, used to remark on such an

occurrence, in the true spirit of *physico-theology*, that the rooks were saying their prayers; and yet this child was much too young to be aware that the scriptures have said of the Deity—that "he feedeth the ravens who call upon him".

I am, &c.

[1] Stone curlews continued to be heard occasionally over the Wakes through the greater part of the nineteenth century, but they have long since ceased to be regular inhabitants of the immediate neighbourhood.

LETTER LX

TO THE SAME

In reading Dr. *Huxham's* [1] *Observationes de Aëre*, &c. written at *Plymouth*, I find by those curious and accurate remarks, which contain an account of the weather from the year 1727 to the year 1748, inclusive, that though there is frequent rain in that district of *Devonshire*, yet the quantity falling is not great; and that some years it has been very small: for in 1731 the rain measured only $17^{inch.}$—$266^{thou.}$ and in 1741, 20—354; and again, in 1743 only 20—908. Places near the sea have frequent scuds, that keep the atmosphere moist, yet do not reach far up into the country; making thus the maritime situations appear wet, when the rain is not considerable. In the wettest years at *Plymouth* the Doctor measured only once 36; and again once, *viz.* 1734, 37—114: a quantity of rain that has twice been exceeded at *Selborne* in the short period of my observations. Dr. *Huxham* remarks, that frequent small rains keep the air moist; while heavy ones render it more dry, by beating down the vapours. He is also of opinion that the *dingy, smoky appearance* in the sky, in very dry seasons, arises from the want of moisture sufficient to let the light through, and render the atmosphere transparent; because he had observed several bodies more diaphanous when wet than dry; and did never recollect that the air had that look in rainy seasons.

My friend,[2] who lives just beyond the top of the down, brought his three swivel guns to try them in my outlet, with their muzzles towards the *Hanger*, supposing that the report would have had a great effect; but the experiment did not answer his expectation. He then removed them to the *Alcove* on the *Hanger*; when the sound, rushing along the *Lythe* and *Comb-wood*, was very grand: but it was at the *Hermitage* that the echoes and repercussions delighted the hearers; not only filling the *Lythe* with the roar, as if all the breeches were tearing up by the roots; but, turning to the left, they pervaded the vale above *Combwood-ponds*; and after a pause seemed to take up the crash again, and to extend round *Harteley-hangers*, and to die away at last among the coppices and coverts of *Ward le ham*. It has been remarked before that this district is an *anathoth*, a place of responses or echoes, and therefore proper for such experiments: we may farther add that the pauses in echoes, when they cease and yet are taken up again, like the pauses in music, surprise the hearers, and have a fine effect on the imagination.

The gentleman above mentioned has just fixed a barometer in his parlour at *Newton Valence*. The tube was first filled here (at *Selborne*) twice with care, when the mercury agreed and stood exactly with my own; but, being filled again twice at *Newton*, the mercury stood, on account of the great elevation of that house, three-tenths of an inch lower than the barometers at this village, and so continues to do, be the weight of the atmosphere what it may. The plate of the barometer at *Newton* is figured as low as 27; because in stormy weather the mercury there will sometimes descend below 28. We have supposed *Newton-house* to stand two hundred feet higher than this house: but if the rule holds good, which says that mercury in a barometer sinks one-tenth of an inch for every hundred feet elevation, then the *Newton* barometer, by standing three-tenths lower than that of *Selborne*, proves that *Newton-house* must be three hundred feet higher than that in which I am writing, instead of two hundred.

It may not be impertinent to add, that the barometers at *Selborne* stand three-tenths of an inch lower than the barometers at *South*

Lambeth[3]: whence we may conclude that the former place is about three hundred feet higher than the latter; and with good reason, because the streams that rise with us run into the *Thames* at *Weybridge*, and so to *London*. Of course therefore there must be lower ground all the way from *Selborne* to *South Lambeth*; the distance between which, all the windings and indentings of the streams considered, cannot be less than an hundred miles.

While we are talking of sounds and their effects it may not be amiss to mention the shock that was given to this neighbourhood by the *Edgar* man of war, which was blown up at Spithead with near a thousand people on board, on the 15th day of October, in the year 1711.*

This concussion, and crash, which was rather felt than heard at this place, was so horrible, tho' at more than thirty miles distance, that a team at plow ran away with fury and amazement, so as to tear the share out of the ground, and to drive it through the body of one of the horses.

The astonishment occasioned by so terrific an explosion may be best expressed by the following spirited and arousing lines of *Milton's* Samson *agonistes*, which are descriptive of a catastrophe equally destructive and calamitous.

MANOAH

" . . . Oh what noise!
" Mercy of heaven, what hideous noise was that!
" Horribly loud. . . .

CHORUS

" Noise call you it, or universal groan
" As if the whole inhabitation perished!
" Blood, death, and deathful deeds are in that noise,
" Ruin, destruction, at the utmost point."

I am, &c.

* The *Edgar*, a 70-gun ship, I think, was just returned from an unsuccessful expedition up the River *Saint Lawrence*; and had on board besides her own crew, many of their women and children, and many friends and relations.

[1] John Huxham, born at Totnes in 1692, studied at Leyden under Boerhaave ; he kept meteorological registers for thirty years, with a view to correlating incidence of fevers, on which he wrote a successful book translated into French and German. His success as a doctor was due to his attention to Nature and to the arts of self-advertisement, which he carried to the length of arranging a fictitious summons during divine service. He achieved his aim so well that the influenza epidemic of 1743 was called Huxham in Germany after him. He became F.R.S. in 1739 and died in 1768.

[2] The Rev. Edmund White, Vicar of Newton Valence from 1785, and nephew of the author.

[3] The home of the author's brother, Thomas Holt White. Selborne is the higher by three hundred and fifty feet ; Newton Valence is two hundred and seventy higher still.

LETTER LXI

TO THE SAME

SINCE the weather of a district is undoubtedly part of it's natural history, I shall make no further apology for the four following letters, which will contain many particulars concerning some of the great frosts and a few respecting some very hot summers, that have distinguished themselves from the rest during the course of my observations.

As the frost in *January* 1768 was, for the small time it lasted, the most severe that we had then known for many years, and was remarkably injurious to ever-greens, some account of it's rigour, and reason of it's ravages, may be useful, and not unacceptable to persons that delight in planting and ornamenting ; and may particularly become a work that professes never to lose sight of utility.

For the last two or three days of the former year there were considerable falls of snow, which lay deep and uniform on the ground without any drifting, wrapping up the more humble vegetation in perfect security. From the first day to the fifth of the new year more snow succeeded ; but from that day the air became entirely clear ; and the heat of the sun about noon had a considerable influence in sheltered situations.

It was in such an aspect that the snow on the author's evergreens was melted every day, and frozen intensely every night; so that the laurustines, bays, laurels, and arbutuses looked, in three or four days, as if they had been burnt in the fire; while a neighbour's plantation of the same kind, in a high cold situation, where the snow was never melted at all, remained uninjured.

From hence I would infer that it is the repeated melting and freezing of the snow that is so fatal to vegetation, rather than the severity of the cold. Therefore it highly behoves every planter, who wishes to escape the cruel mortification of losing in a few days the labour and hopes of years, to bestir himself on such emergencies; and, if his plantations are small, to avail himself of mats, cloths, pease-haum, straw, reeds, or any such covering, for a short time; or, if his shrubberies are extensive, to see that his people go about with prongs and forks, and carefully dislodge the snow from the boughs, since the naked foliage will shift much better for itself, than where the snow is partly melted and frozen again.

It may perhaps appear at first like a paradox; but doubtless the more tender trees and shrubs should never be planted in hot aspects; not only for the reason assigned above, but also because, thus circumstanced, they are disposed to shoot earlier in the spring, and grow on later in the autumn, than they would otherwise do, and so are sufferers by lagging or early frosts. For this reason also plants from *Siberia* will hardly endure our climate; because, on the very first advances of spring, they shoot away, and so are cut off by the severe nights of *March* or *April*.

Dr. *Fothergill*[1] and others have experienced the same inconvenience with respect to the more tender shrubs from *North-America*; which they therefore plant under north-walls. There should also perhaps be a wall to the east to defend them from the piercing blasts from that quarter.

This observation might without any impropriety be carried into animal life; for discerning bee-masters now find that their hives should not in the winter be exposed to the hot sun, because

such unseasonable warmth awakens the inhabitants too early from their slumbers; and, by putting their juices into motion too soon, subjects them afterwards to inconveniences when rigorous weather returns.

The coincidents attending this short but intense frost were, that the horses fell sick with an epidemic distemper, which injured the winds of many, and killed some; that colds and coughs were general among the human species; that it froze under people's beds for several nights; that meat was so hard frozen that it could not be spitted, and could not be secured but in cellars; that several redwings and thrushes were killed by the frost; and that the larger titmouse continued to pull straws lengthwise from the eaves of thatched houses and barns in a most adroit manner, for a purpose that has been explained already.*

On the 3d of *January Benjamin Martin's* thermometer within doors, in a close parlour where there was no fire, fell in the night to 20, and on the 4th to 18, and the 7th to $17\frac{1}{2}$, a degree of cold which the owner never since saw in the same situation; and he regrets much that he was not able at that juncture to attend his instrument abroad. All this time the wind continued north and north-east; and yet on the 8th roost-cocks, which had been silent, began to sound their clarions, and crows to clamour, as prognostic of milder weather; and, moreover, moles began to heave and work, and a manifest thaw took place. From the latter circumstance we may conclude that thaws often originate under ground from warm vapours which arise; else how should subterraneous animals receive such early intimations of their approach? Moreover, we have often observed that cold seems to descend from above; for, when a thermometer hangs abroad in a frosty night, the intervention of a cloud shall immediately raise the mercury ten degrees; and a clear sky shall again compel it to descend to it's former gage.

And here it may be proper to observe, on what has been said above, that though frosts advance to their utmost severity by some-

* See Letter XLI. to Mr. *Pennant.*

what of a regular gradation, yet thaws do not usually come on by as regular a declension of cold; but often take place immediately from intense freezing; as men in sickness often mend at once from a paroxysm.

To the great credit of *Portugal* laurels and *American* junipers, be it remembered that they remained untouched amidst the general havock: hence men should learn to ornament chiefly with such trees as are able to withstand accidental severities, and not subject themselves to the vexation of a loss which may befall them once perhaps in ten years, yet may hardly be recovered through the whole course of their lives.

As it appeared afterwards the ilexes were much injured, the cypresses were half destroyed, the arbutuses lingered on, but never recovered; and the bays, laurustines, and laurels, were killed to the ground; and the very wild hollies, in hot aspects, were so much affected that they cast all their leaves.

By the 14th of *January* the snow was entirely gone; the turnips emerged not damaged at all, save in sunny places; the wheat looked delicately, and the garden plants were well preserved; for snow is the most kindly mantle that infant vegetation can be wrapped in: were it not for that friendly meteor no vegetable life could exist at all in northerly regions. Yet in *Sweden* the earth in *April* is not divested of snow for more than a fortnight before the face of the country is covered with flowers.

[1] Dr. John Fothergill (1712–80), an eminent physician and member of several learned societies, was educated at Sedbergh School, served his time with a Bradford apothecary, and studied at St. Thomas's Hospital, Edinburgh, and Leyden, after which he began to practise in London, becoming immensely rich. According to a contemporary notice, "He had a very extensive practice, but he did not add to his art any great or various improvements. His pamphlet on the ulcerous sore throat is, on every account, the best of his publications. In 1762 Dr. Fothergill purchased an estate at Upton in Essex; and formed a botanic garden there, the second in Europe: Kew is the first." The place was valued at £10,000, and it kept fifteen men constantly employed. He took much trouble to contrive a method of generating and preserving ice in the West Indies; among his many other interests were the improvement of London, and the Bible, of which he had a complete new translation made and

printed. He was a Quaker ; during his recess he attended to prescribe at an inn near his Cheshire home, and would take no fees there, but during the influenza epidemic of 1775–6 " he is said to have had sixty patients on his list daily, and his profit was estimated at £8,000 per annum ". His fortune amounted to about £80,000, and more than seventy coaches and post-chaises followed his funeral, notwithstanding the intention of the executors to keep it private. He introduced digitalis and his " Account of the Foxglove " is a pharmacological classic.

LETTER LXII

TO THE SAME

THERE were some circumstances attending the remarkable frost in *January* 1776 so singular and striking, that a short detail of them may not be unacceptable.

The most certain way to be exact will be to copy the passages from my journal, which were taken from time to time as things occurred. But it may be proper previously to remark that the first week in *January* was uncommonly wet, and drowned with vast rains from every quarter : from whence may be inferred, as there is great reason to believe is the case, that intense frosts seldom take place till the earth is perfectly glutted and chilled with water ;* and hence dry autumns are seldom followed by rigorous winters.

January 7th.—Snow driving all the day, which was followed by frost, sleet, and some snow, till the 12th, when a prodigious mass overwhelmed all the works of men, drifting over the tops of the gates and filling the hollow lanes.

On the 14th the writer was obliged to be much abroad ; and thinks he never before or since has encountered such rugged *Siberian* weather. Many of the narrow roads were now filled above the tops of the hedges ; through which the snow was driven into most

* The autumn preceding *January* 1768 was very wet, and particularly the month of *September*, during which there fell at *Lyndon*, in the county of *Rutland, six inches and an half* of rain. And the terrible long frost of 1739–40 set in after a rainy season, and when the springs were very high.

romantic and grotesque shapes, so striking to the imagination as not to be seen without wonder and pleasure. The poultry dared not to stir out of their roosting places; for cocks and hens are so dazzled and confounded by the glare of snow that they would soon perish without assistance. The hares also lay sullenly in their seats, and would not move till compelled by hunger; being conscious, poor animals, that the drifts and heaps treacherously betray their footsteps, and prove fatal to numbers of them.

From the 14th the snow continued to increase, and began to stop the road waggons and coaches, which could no longer keep on their regular stages; and especially on the western roads, where the fall appears to have been deeper than in the south. The company at *Bath*, that wanted to attend the *Queen's birthday*, were strangely incommoded: many carriages of persons, who got in their way to town from *Bath* as far as *Marlborough*, after strange embarrassments, here met with a *ne plus ultra*. The ladies fretted, and offered large rewards to labourers, if they would shovel them a track to *London*: but the relentless heaps of snow were too bulky to be removed; and so the 18th passed over, leaving the company in very uncomfortable circumstances at the *Castle* and other inns.

On the 20th the sun shone out for the first time since the frost began; a circumstance that has been remarked before much in favour of vegetation. All this time the cold was not very intense, for the thermometer stood at 29, 28, 25, and thereabout; but on the 21st it descended to 20. The birds now began to be in a very pitiable and starving condition. Tamed by the season, sky-larks settled in the streets of towns, because they saw the ground was bare; rooks frequented dunghills close to houses; and crows watched horses as they passed, and greedily devoured what dropped from them; hares now came into men's gardens, and, scraping away the snow, devoured such plants as they could find.

On the 22d the author had occasion to go to *London* through a sort of *Laplandian-scene*, very wild and grotesque indeed. But the metropolis itself exhibited a still more singular appearance than

the country; for, being bedded deep in snow, the pavement of the streets could not be touched by the wheels or the horses' feet, so that the carriages ran about without the least noise. Such an exemption from din and clatter was strange, but not pleasant; it seemed to convey an uncomfortable idea of desolation:

"— — — — — — — — ipsa silentia terrent."

On the 27th much snow fell all day, and in the evening the frost became very intense. At *South Lambeth*, for the four following nights, the thermometer fell to 11, 7, 6, 6; and at *Selborne* to 7, 6, 10; and on the 31st of *January*, just before sun-rise, with rime on the trees, and on the tube of the glass, the quicksilver sunk exactly to zero, being 32 degrees below the freezing point: but by eleven in the morning, though in the shade, it sprung up to 16½ *—a most unusual degree of cold this for the south of *England*! During these four nights the cold was so penetrating that it occasioned ice in warm chambers and under beds; and in the day the wind was so keen that persons of robust constitutions could scarcely endure to face it. The *Thames* was at once so frozen over both above and below bridge that crowds ran about on the ice. The streets were now strangely incumbered with snow, which crumbled and trod dusty; and, turning grey, resembled bay-salt: what had fallen on the roofs was so perfectly dry that, from first to last, it lay twenty-six days on the houses in the city; a longer time than had been remembered by the oldest housekeepers living. According to all appearances we might now have expected the continuance of this rigorous weather for weeks to come, since every night increased in severity; but behold, without any apparent cause, on the 1st of *February* a thaw took place, and some rain followed before night; making good the observation above, that frosts often go off as it were at once, without any gradual declension of cold. On the 2d of *February*

* At *Selborne* the cold was greater than at any other place that the author could hear of with certainty: though some reported at the time that at a village in *Kent* the thermometer fell two degrees below zero, *viz.* 34 degrees below the freezing point. The thermometer used at *Selborne* was graduated by *Benjamin Martin*.

the thaw persisted; and on the 3d swarms of little insects were frisking and sporting in a court-yard at *South Lambeth*, as if they had felt no frost. Why the juices in the small bodies and smaller limbs of such minute beings are not frozen is a matter of curious inquiry.

Severe frosts seem to be partial, or to run in currents; for, at the same juncture, as the author was informed by accurate correspondents, at *Lyndon*, in the county of *Rutland*, the thermometer stood at 19; at *Blackburn*, in *Lancashire*, at 19; and at *Manchester* at 21, 20, and 18. Thus does some unknown circumstance strangely overbalance latitude, and render the cold sometimes much greater in the southern than the northern parts of this kingdom.

The consequences of this severity were, that in *Hampshire*, at the melting of the snow, the wheat looked well, and the turnips came forth little injured. The laurels and laurustines were somewhat damaged, but only in *hot aspects*. No evergreens were quite destroyed; and not half the damage sustained that befell in *January* 1768. Those laurels that were a little scorched on the south-sides were perfectly untouched on their north-sides. The care taken to shake the snow day by day from the branches seemed greatly to avail the author's evergreens. A neighbour's laurel-hedge, in a high situation, and facing to the north, was perfectly green and vigorous; and the *Portugal laurels* remained unhurt.

As to the birds, the thrushes and blackbirds were mostly destroyed; and the partridges, by the weather and poachers, were so thinned that few remained to breed the following year.

LETTER LXIII

TO THE SAME

As the frost in *December* 1784 was very extraordinary, you, I trust, will not be displeased to hear the particulars; and especially when I promise to say no more about the severities of winter after I have finished this letter.

The first week in *December* was very wet, with the barometer very low. On the 7th, with the barometer at 28—five tenths, came on a vast snow, which continued all that day and the next, and most part of the following night; so that by the morning of the 9th the works of men were quite overwhelmed, the lanes filled so as to be impassable, and the ground covered twelve or fifteen inches without any drifting. In the evening of the 9th the air began to be so very sharp that we thought it would be curious to attend to the motions of a thermometer: we therefore hung out two; one made by *Martin* and one by *Dollond*, which soon began to shew us what we were to expect; for, by ten o'clock, they fell to 21, and at eleven to 4, when we went to bed. On the 10th, in the morning, the quicksilver of *Dollond's* glass was down to *half a degree below zero*; and that of Martin's, which was absurdly graduated only to four degrees *above zero*, sunk quite into the brass guard of the ball; so that when the weather became most interesting this was useless. On the 10th, at eleven at night, though the air was perfectly still, *Dollond's* glass went down to *one degree below zero*! This strange severity of the weather made me very desirous to know what degree of cold there might be in such an exalted and near situation as *Newton*.[1] We had therefore, on the morning of the 10th, written to Mr. ——, and entreated him to hang out his thermometer, made by *Adams*; and to pay some attention to it morning and evening; expecting wonderful phænomena, in so elevated a region, at two hundred feet or more above my house. But, behold! on the 10th, at eleven at night, it was down only to 17, and the next morning at 22, when mine was at ten! We were so disturbed at this unexpected reverse of comparative local cold, that we sent one of my glasses up, thinking that of Mr. —— must, some how, be wrongly constructed. But, when the instruments came to be confronted, they went exactly together: so that, for one night at least, the cold at *Newton* was 18 degrees less than at *Selborne*; and, through the whole frost, 10 or 12 degrees; and indeed, when we came to observe consequences, we could readily credit this; for all my laurustines, bays, ilexes,

arbutuses, cypresses, and even my *Portugal laurels*,* and (which occasions more regret) my fine sloping laurel hedge, were scorched up; while, at *Newton*, the same trees have not lost a leaf!

We had steady frost on to the 25th, when the thermometer in the morning was down to 10 with us, and at *Newton* only to 21. Strong frost continued till the 31st, when some tendency to thaw was observed; and, by *January* the 3d, 1785, the thaw was confirmed, and some rain fell.

A circumstance that I must not omit, because it was new to us, is, that on *Friday, December* the 10th, being bright sun-shine, the air was full of icy *spiculæ*, floating in all directions, like atoms in a sun-beam let into a dark room. We thought them at first particles of the rime falling from my tall hedges; but were soon convinced to the contrary, by making our observations in open places where no rime could reach us. Were they watery particles of the air frozen as they floated; or were they evaporations from the snow frozen as they mounted?

We were much obliged to the thermometers for the early information they gave us; and hurried our apples, pears, onions, potatoes, &c. into the cellar, and warm closets; while those who had not, or neglected such warnings, lost all their stores of roots and fruits, and had their very bread and cheese frozen.

I must not omit to tell you that, during those two *Siberian* days, my parlour-cat was so electric, that had a person stroked her, and been properly *insulated*, the shock might have been given to a whole circle of people.

I forgot to mention before, that, during the two severe days, two men, who were tracing hares in the snow, had their feet frozen; and two men, who were much better employed, had their fingers so affected by the frost, while they were thrashing in a barn, that

* Mr. *Miller*,[2] in his Gardener's Dictionary, says positively that the *Portugal laurels* remained untouched in the remarkable frost of 1739–40. So that either that accurate observer was much mistaken, or else the frost of *December* 1784 was much more severe and destructive than that in the year above-mentioned.

a mortification followed, from which they did not recover for many weeks.

This frost killed all the furze and most of the ivy, and in many places stripped the hollies of all their leaves. It came at a very early time of the year, before old *November* [3] ended; and yet may be allowed from it's effects to have exceeded any since 1739–40.

[1] Newton Valence, where the observer was the vicar, Richard Yalden, who died a few weeks later. Benjamin Martin, George Adam, and John and Peter Dollond were leading opticians and mathematical instrument makers of the time.

[2] Philip Miller (1691–1771) was foreman of Chelsea Garden from 1722 to 1770, and during the earlier part of that period the best gardener in England.

[3] The calendar had been put back eleven days by Act of Parliament (24 Geo. II. c. 23) in 1752.

LETTER LXIV

TO THE SAME

As the effects of heat are seldom very remarkable in the northerly climate of *England*, where the summers are often so defective in warmth and sun-shine as not to ripen the fruits of the earth so well as might be wished, I shall be more concise in my account of the severity of a summer season, and so make a little amends for the prolix account of the degrees of cold, and the inconveniences that we suffered from late rigorous winters.

The summers of 1781 and 1783 were unusually hot and dry; to them therefore I shall turn back in my journals, without recurring to any more distant period. In the former of these years my peach and nectarine-trees suffered so much from the heat that the rind on the bodies was scalded and came off; since which the trees have been in a decaying state. This may prove a hint to assiduous gardeners to fence and shelter their wall-trees with mats or boards, as they may easily do, because such annoyance is seldom of long continuance. During that summer also, I observed that my apples were coddled, as it were, on the trees; so that they had no quick-

ness of flavour, and would not keep in the winter. This circumstance put me in mind of what I have heard travellers assert that they never ate a good apple or apricot in the south of *Europe*, where the heats were so great as to render the juices vapid and insipid.

The great pests of a garden are wasps, which destroy all the finer fruits just as they are coming into perfection. In 1781 we had none; in 1783 there were myriads; which would have devoured all the produce of my garden, had not we set the boys to take the nests, and caught thousands with hazel twigs tipped with bird-lime: we have since employed the boys to take and destroy the large breeding wasps in the spring. Such expedients have a great effect on these marauders, and will keep them under. Though wasps do not abound but in hot summers, yet they do not prevail in every hot summer, as I have instanced in the two years above-mentioned.

In the sultry season of 1783 honey-dews were so frequent as to deface and destroy the beauties of my garden. My honeysuckles, which were one week the most sweet and lovely objects that the eye could behold, became the next the most loathsome; being enveloped in a viscous substance,[1] and loaded with black aphides, or smother-flies. The occasion of this clammy appearance seems to be this, that in hot weather the effluvia of flowers in fields and meadows and gardens are drawn up in the day by a brisk evaporation, and then in the night fall down again with the dews, in which they are entangled; that the air is strongly scented, and therefore impregnated with the particles of flowers in summer weather, our senses will inform us; and that this clammy sweet substance is of the vegetable kind we may learn from bees, to whom it is very grateful: and we may be assured that it falls in the night, because it is always seen first in warm still mornings.

On chalky and sandy soils, and in the hot villages about *London*, the thermometer has been often observed to mount as high as 83 or 84; but with us, in this hilly and woody district, I have hardly ever seen it exceed 80; nor does it often arrive at that pitch. The reason, I conclude, is, that our dense clayey soil, so much shaded

by trees, is not so easily heated through as those above-mentioned: and, besides, our mountains cause currents of air and breezes; and the vast effluvia from our woodlands temper and moderate our heats.

[1] It is the aphides which make "honey-dew" and not the flowers.

LETTER LXV

TO THE SAME

THE summer of the year 1783 was an amazing and portentous one, and full of horrible phænomena; for, besides the alarming meteors and tremendous thunder-storms that affrighted and distressed the different counties of this kingdom, the peculiar *haze*, or smokey fog, that prevailed for many weeks in this island, and in every part of *Europe*, and even beyond it's limits, was a most extraordinary appearance, unlike anything known within the memory of man. By my journal I find that I had noticed this strange occurrence [1] from *June* 23 to *July* 20 inclusive, during which period the wind varied to every quarter without making any alteration in the air. The sun, at noon, looked as blank as a clouded moon, and shed a rust-coloured ferruginous light on the ground, and floors of rooms; but was particularly lurid and blood-coloured at rising and setting. All the time the heat was so intense that butchers' meat could hardly be eaten on the day after it was killed; and the flies swarmed so in the lanes and hedges that they rendered the horses half frantic, and riding irksome. The country people began to look with a superstitious awe at the red, louring aspect of the sun; and indeed there was reason for the most enlightened person to be apprehensive; for, all the while, *Calabria* and part of the isle of *Sicily*, were torn and convulsed with earthquakes; and about that juncture a *volcano* sprung out of the sea on the coast of *Norway*. On this occasion *Milton*'s noble simile of the sun, in his first book of *Paradise Lost*,

frequently occurred to my mind; and it is indeed particularly applicable, because, towards the end, it alludes to a superstitious kind of dread, with which the minds of men are always impressed by such strange and unusual phænomena.

"— — — As when the *sun*, new risen,
"Looks through the horizontal, *misty* air,
"*Shorn* of his *beams*; or from behind the moon,
"In *dim* eclipse, *disastrous twilight sheds*
"On half the nations, and with *fear* of *change*
"*Perplexes* monarchs. — — — — — —"

[1] In Parson Woodforde's Diary the first note is on June 25th: "Very uncommon Lazy and hot Weather. The Sun very red at setting. . . . June 26 . . . Very uncommon hot, misty Days—with cold Nights. . . . July 13 . . . The Weather still very uncommonly hazy and Sun red. . . . July 27th . . . Nancy was obliged to change Horses, the flies teazing Phyllis very much which made her kick a little. . . . Aug. 19 . . . A large Ball of Fire for miles round was seen last Night between 9 and 10 o'clock by many People." The cause of this phenomenon was undoubtedly the great eruption of Skapter Jokull in Iceland, which began in May 1783 and actually destroyed crops in the north of Scotland.

LETTER LXVI

TO THE SAME

We are very seldom annoyed with thunder-storms; and it is no less remarkable than true, that those which arise in the south have hardly been known to reach this village; for, before they get over us, they take a direction to the east or to the west, or sometimes divide into two, and go in part to one of those quarters, and in part to the other; as was truly the case in summer 1783, when, though the country round was continually harassed with tempests, and often from the south, yet we escaped them all; as appears by my journal of that summer. The only way that I can at all account for this fact—for such it is—is that, on that quarter, between us and the sea, there are continual mountains, hill behind hill, such as *Nore-hill*,

the *Barnet*, *Butser-hill*, and *Ports-down*, which some how divert the storms, and give them a different direction. High promontories, and elevated grounds, have always been observed to attract clouds and disarm them of their mischievous contents, which are discharged into the trees and summits as soon as they come in contact with those turbulent meteors; while the humble vales escape, because they are so far beneath them.

But, when I say I do not remember a thunder-storm from the south, I do not mean that we never have suffered from thunder-storms at all; for on *June* 5th, 1784, the thermometer in the morning being at 64, and at noon at 70, the barometer at 29—six tenths one-half, and the wind north, I observed a blue mist, smelling strongly of sulphur, hanging along our sloping woods, and seeming to indicate that thunder was at hand. I was called in about two in the afternoon, and so missed seeing the gathering of the clouds in the north; which they who were abroad assured me had something uncommon in it's appearance. At about a quarter after two the storm began in the parish of *Hartley*, moving slowly from north to south; and from thence it came over *Norton-farm*, and so to *Grange-farm*, both in this parish. It began with vast drops of rain, which were soon succeeded by round hail, and then by convex pieces of ice, which measured three inches in girth. Had it been as extensive as it was violent, and of any continuance (for it was very short), it must have ravaged all the neighbourhood. In the parish of *Hartley* it did some damage to one farm; but *Norton*, which lay in the center of the storm, was greatly injured; as was *Grange*, which lay next to it. It did but just reach to the middle of the village, where the hail broke my north windows, and all my garden-lights and hand-glasses, and many of my neighbours' windows. The extent of the storm was about two miles in length and one in breadth. We were just sitting down to dinner; but were soon diverted from our repast by the clattering of tiles and the jingling of glass. There fell at the same time prodigious torrents of rain on the farms above-mentioned, which occasioned a flood as violent

as it was sudden; doing great damage to the meadows and fallows, by deluging the one and washing away the soil of the other. The hollow lane towards *Alton* was so torn and disordered as not to be passable till mended, rocks being removed that weighed 200 weight. Those that saw the effect which the great hail had on ponds and pools say that the dashing of the water made an extraordinary appearance, the froth and spray standing up in the air three feet above the surface. The rushing and roaring of the hail, as it approached, was truly tremendous.

Though the clouds at *South Lambeth*, near *London*, were at that juncture thin and light, and no storm was in sight, nor within hearing, yet the air was strongly electric; for the bells of an electric machine at that place rang repeatedly, and fierce sparks were discharged.

When I first took the present work in hand, I proposed to have added an *Annus Historico-naturalis*, or the Natural History of the Twelve Months of the Year; which would have comprised many incidents and occurrences that have not fallen in my way to be mentioned in my series of letters;—but, as Mr. *Aikin* of *Warrington* has lately published somewhat of this sort, and as the length of my correspondence has sufficiently put your patience to the test, I shall here take a respectful leave of you and natural history together;

And am,

With all due deference and regard,

Your most obliged,

And most humble servant,

GIL. WHITE.

Selborne, *June* 25, 1787.

SUMMARY OF THE WEATHER

SUMMARY OF THE WEATHER

MEASURE OF RAIN IN INCHES AND HUNDREDS

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1782.	4·64	1·98	6·54	4·57	6·34	1·75	7·09	8·28	3·72	1·93	2·51	0·91	50·26
1783.	4·43	5·54	2·16	0·88	2·84	2·82	1·45	2·24	5·52	1·71	3·01	1·10	33·71
1784.	3·18	0·77	3·82	3·92	1·52	3·65	2·40	3·88	2·51	0·39	4·70	3·06	33·80
1785.	2·84	1·80	0·30	0·17	0·60	1·39	3·80	3·21	5·94	5·21	2·27	4·2	31·55
1786.	6·91	1·42	1·62	1·81	2·40	1·20	1·99	4·34	4·79	5·4	4·38	—	—
1787.	0·88	3·67	4·28	0·74	2·60	1·50	6·53	0·83	1·56	5·4	4·9	5·6	36·24
1788.	1·60	3·37	1·31	0·61	0·76	1·27	3·58	3·22	5·71	0·0	0·86	0·23	22·50
1789.	4·48	4·11	2·47	1·81	4·5	4·24	3·69	0·99	2·82	5·4	3·67	4·62	42· –
1790.	1·99	0·49	0·45	3·64	4·38	0·13	3·24	2·30	0·66	2·10	6·95	5·94	32·27
1791.	6·73	4·64	4·59	1·13	1·33	0·91	5·56	1·73	1·73	6·49	8·16	4·93	44·93
1792.	6·7	1·68	6·70	4·08	3·00	2·78	5·16	4·25	5·53	5·55	1·65	2·11	48·56
1793.	3·71	2·32	2·33	3·19	1·21								

1768 begins with a fortnight's frost and snow; rainy during February. Cold and wet spring; wet season from the beginning of June to the end of harvest. Latter end of September foggy without rain. All October and the first part of November rainy, and thence to the end of the year alternate rains and frosts.

1769. January and February, frosty and rainy, with gleams of fine weather in the intervals. To the middle of March, wind and rain. To the end of March, dry and windy. To the middle of April, stormy, with rain. To the end of June, fine weather with rain. To the beginning of August, warm, dry weather. To the end of September, rainy with short intervals of fine weather. To the latter end of October, frosty mornings, with fine days. The

next fortnight rainy; thence to the end of November dry and frosty. December, windy, with rain and intervals of frost, and the first fortnight very foggy.

1770. Frost for the first fortnight: during the 14th and 15th all the snow melted. To the end of February, mild hazy weather. The whole of March, frosty, with bright weather. April, cloudy, with rain and snow. May began with summer showers, and ended with dark, cold rains. June, rainy, chequered with gleams of sunshine. The first fortnight in July, dark and sultry; the latter part of the month, heavy rain. August, September, and the first fortnight in October, in general fine weather, though with frequent interruptions of rain; from the middle of October to the end of the year almost incessant rains.

1771. Severe frosts till the last week in January. To the first week in February, rain and snow: to the end of February, spring weather. To the end of the third week in April, frosty weather. To the end of the first fortnight in May, spring weather, with copious showers. To the end of June, dry, warm weather. The first fortnight in July, warm, rainy weather. To the end of September, warm weather, but in general cloudy, with showers. October rainy. November frost, with intervals of fog and rain. December, in general, bright, mild weather, with hoar frosts.

1772. To the end of the first week in February, frost and snow. To the end of the first fortnight in March, frost, sleet, rain, and snow. To the middle of April, cold rains. To the middle of May, dry weather, with cold piercing winds. To the end of the first week in June, cool showers. To the middle of August, hot, dry, summer weather. To the end of September, rain with storms and thunder. To December 22nd, rain with mild weather. December 23rd, the first ice. To the end of the month cold, foggy weather.

1773. The first week in January, frost; thence to the end of the month, dark rainy weather. The first fortnight in February, hard frost. To the end of the first week in March, misty, showery weather. Bright spring days to the close of the month. Frequent

showers to the latter end of April. To the end of June, warm showers, with intervals of sunshine. To the end of August, dry weather with a few days of rain. To the end of the first fortnight in November, rainy. The next four weeks, frost: and thence to the end of the year, rainy.

1774. Frost and rain to the end of the first fortnight in March; thence to the end of the month, dry weather. To the 15th April, showers; thence to the end of April, fine spring days. During May, showers and sunshine in about an equal proportion. Dark rainy weather to the end of the third week in July; thence to the 24th August, sultry, with thunder and occasional showers. To the end of the third week in November, rain, with frequent intervals of sunny weather. To the end of December, dark, dripping fogs.

1775. To the end of the first fortnight in March, rain almost every day. To the first week in April, cold winds, with showers of rain and snow. To the end of June, warm, bright weather, with frequent showers. The first fortnight in July, almost incessant rains. To the 26th August, sultry weather with frequent showers. To the end of the third week in September, rain with a few intervals of fine weather. To the end of the year, rain with intervals of hoar-frost and sunshine.

1776. To January 24th, dark frosty weather, with much snow. March 24th, to the end of the month, foggy with hoar-frost. To the 30th May, dark, dry, harsh weather, with cold winds. To the end of the first fortnight in July, warm, with much rain. To the end of the first week in August, hot and dry, with intervals of thunder showers. To the end of October, in general, fine seasonable weather, with a considerable proportion of rain. To the end of the year, dry, frosty weather, with some days of hard rain.

1777. To the 10th January, hard frost. To the 20th January, foggy, with frequent showers. To the 18th February, hard dry frost with snow. To the end of May, heavy showers, with intervals of warm dry spring days. To the 8th July, dark, with heavy rain. To the 18th July, dry, warm weather. To the end of July, very heavy

rains. To the 12th October, remarkably fine warm weather. To the end of the year, grey mild weather, with but little rain, and still less frost.

1778. To the 13th January, frost, with a little snow: to the 24th January, rain: to the 30th, hard frost. To the 23rd February, dark, harsh, foggy weather, with rain. To the end of the month, hard frost, with snow. To the end of the first fortnight in March, dark, harsh weather. From the first, to the end of the first fortnight in April, spring weather. To the end of the month, snow and ice. To the 11th June, cool, with heavy showers. To the 19th July, hot, sultry, parching weather. To the end of the month, heavy showers. To the end of September, dry warm weather. To the end of the year wet, with considerable intervals of sunshine.

1779. Frost and showers to the end of January. To 21st April, warm dry weather. To 8th May, rainy. To the 7th June, dry and warm. To the 6th July, hot weather, with frequent rain. To the 18th July, dry hot weather. To August 8th, hot weather, with frequent rains. To the end of August, fine dry harvest weather. To the end of November, fine autumnal weather, with intervals of rain. To the end of the year, rain with frost and snow.

1780. To the end of January, frost. To the end of February, dark, harsh weather, with frequent intervals of frost. To the end of March, warm showery spring weather. To the end of April, dark harsh weather, with rain and frost. To the end of the first fortnight in May, mild, with rain. To the end of August, rain and fair weather in pretty equal proportions. To the end of October, fine autumnal weather, with intervals of rain. To the 24th November, frost. To December 16th, mild dry foggy weather. To the end of the year frost and snow.

1781. To January 25th, frost and snow. To the end of February, harsh and windy, with rain and snow. To April 5th, cold, drying winds. To the end of May, mild spring weather, with a few light showers. June began with heavy rain, but thence to the

end of October, dry weather, with a few flying showers. To the end of the year, open weather with frequent rains.

1782. To February 4th, open mild weather. To February 22nd, hard frost. To the end of March, cold blowing weather, with frost and snow and rain. To May 7th, cold dark rains. To the end of May, mild, with incessant rains. To the end of June, warm and dry. To the end of August warm, with almost perpetual rains. The first fortnight in September mild and dry; thence to the end of the month, rain. To the end of October, mild with frequent showers. November began with hard frost, and continued throughout with alternate frost and thaw. The first part of December frosty: the latter part mild.

1783. To January 16th, rainy with heavy winds. To the 24th, hard frost. To the end of the first fortnight in February, blowing, with much rain. To the end of February, stormy dripping weather. To the 9th May, cold harsh winds (thick ice on 5th May). To the end of August, hot weather, with frequent showers. To the 23rd September, mild, with heavy driving rains. To November 12th, dry mild weather. To the 18th December, grey soft weather, with a few showers. To the end of the year, hard frost.

1784. To February 19th, hard frost, with two thaws: one the 14th January, the other 5th February. To February 28th, mild, wet fogs. To the 3rd March, frost with ice. To March 10th, sleet and snow. To April 2nd, snow and hard frost. To April 27th, mild weather, with much rain. To May 12th, cold drying winds. To May 20th, hot cloudless weather. To June 27th, warm with frequent showers. To July 18th, hot and dry. To the end of August, warm with heavy rains. To November 6th, clear mild autumnal weather, except a few days of rain at the latter end of September. To the end of the year, fog, rain, and hard frost (on December 10th, the thermometer 1° below 0).

1785. A thaw began on the 2nd January, and rainy weather with wind continued to January 28th. To 15th March, very hard frost. To 21st March, mild, with sprinkling showers. To April 7th,

hard frost. To May 17th, mild windy weather, without a drop of rain. To the end of May, cold, with a few showers. To June 9th, mild weather, with frequent soft showers. To July 13th, hot dry weather, with a few showery intervals. To July 22nd, heavy rain. To the end of September, warm with frequent showers. To the end of October, frequent rain. To 18th November, dry, mild weather. (Hay-making finished November 9th, and the wheat harvest November 14th.) To December 23rd, rain. To the end of the year, hard frost.

1786. To the 7th January, frost and snow. To January 13th, mild with much rain. To 21st January, deep snow. To February 11th, mild with frequent rains. To 21st February, dry, with high winds. To 10th March, hard frost. To 13th April, wet, with intervals of frost. To the end of April, dry mild weather. On the 1st and 2nd May, thick ice. To 10th May, heavy rain. To June 14th, fine warm dry weather. From the 8th to the 11th July, heavy showers. To October 13th, warm, with frequent showers. To October 19th, ice. To October 24th, mild pleasant weather. To November 3rd, frost. To December 16th, rain, with a few detached days of frost. To the end of the year frost and snow.

1787. To January 24th, dark, moist, mild weather. To January 28th, frost and snow. To February 16th, mild showery weather. To February 28th, dry, cool weather. To March 10th, stormy with driving rain. To March 24th, bright frosty weather. To the end of April mild, with frequent rain. To May 22nd, fine bright weather. To the end of June, mostly warm, with frequent showers (on June 7th, ice as thick as a crown piece). To the end of July, hot and sultry, with copious rain. To the end of September, hot dry weather, with occasional showers. To November 23rd, mild, with light frosts and rain. To the end of November, hard frost. To December 21st, still and mild, with rain. To the end of the year, frost.

1788. To January 13th, mild and wet. To January 18th, frost. To the end of the month, dry windy weather. To the end of Febru-

ary, frosty, with frequent showers. To March 14th, hard frost. To the end of March, dark, harsh weather, with frequent showers. To April 4th, windy, with showers. To the end of May, bright, dry, warm weather, with a few occasional showers. From June 28th to July 17th, heavy rains. To August 12th, hot dry weather. To the end of September, alternate showers and sunshine. To November 22nd, dry, cool weather. To the end of the year, hard frost.

1789. To January 13th, hard frost. To the end of the month, mild, with showers. To the end of February, frequent rain, with snow-showers and heavy gales of wind. To 13th March, hard frost with snow. To April 18th, heavy rain, with frost and snow and sleet. To the end of April, dark, cold weather, with frequent rains. To June 9th, warm spring weather, with brisk winds and frequent showers. From June 4th to the end of July, warm, with much rain. To August 29th, hot, dry, sultry weather. To September 11th, mild, with frequent showers. To the end of September fine autumnal weather, with occasional showers. To November 17th, heavy rain, with violent gales of wind. To December 18th, mild dry weather, with a few showers. To the end of the year, rain and wind.

1790. To January 16th, mild foggy weather, with occasional rains. To January 21st, frost. To January 28th, dark, with driving rains. To February 14th, mild, dry weather. To February 22nd, hard frost. To April 5th, bright cold weather, with a few showers. To April 15th, dark and harsh, with a deep snow. To April 21st, cold cloudy weather, with ice. To June 6th, mild spring weather, with much rain. From July 3rd, to July 14th, cool, with heavy rain. To the end of July, warm, dry weather. To August 6th, cold, with wind and rain. To August 24th, fine harvest weather. To September 5th, strong gales, with driving showers. To November 26th, mild autumnal weather, with frequent showers. To December 1st, hard frost and snow. To the end of the year, rain and snow, and a few days of frost.

1791. To the end of January, mild, with heavy rains. To the end of February windy, with much rain and snow. From March to the end of June, mostly dry, especially June. March and April rather cold and frosty. May and June, hot. July, rainy. Fine harvest weather, and pretty dry, to the end of September. Wet October, and cold towards the end. Very wet and stormy in November. Much frost in December.

1792. Some hard frost in January, but mostly wet and mild. February, some hard frost and a little snow. March, wet and cold. April, great storms on the 13th, then some very warm weather. May and June, cold and dry. July, wet and cool; indifferent harvest, rather late and wet. September, windy and wet. October, showery and mild. November, dry and fine. December, mild.

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POEMS

THE INVITATION TO SELBORNE

See Selborne spreads her boldest beauties round,
The varied valley, and the mountain ground,
Wildly majestic! what is all the pride
Of flats, with loads of ornament supplied?
Unpleasing, tasteless, impotent expense,
Compared with Nature's rude magnificence.
Arise, my stranger, to these wild scenes haste;
The unfinish'd farm awaits your forming taste:
Plan the pavilion, airy, light, and true;
Through the high arch call in the length'ning view;
Expand the forest sloping up the hill;
Swell to a lake the scant, penurious rill;
Extend the vista, raise the castle mound
In antique taste with turrets ivy-crown'd;
O'er the gay lawn the flowery shrub dispread,
Or with the blending garden mix the mead;
Bid China's pale, fantastic fence, delight;
Or with the mimic statue trap the sight.
Oft on some evening, sunny, soft, and still,
The Muse shall lead thee to the beech-grown hill,
To spend in tea the cool, refreshing hour,
Where nods in air the pensile, nest-like bower; *
Or where the Hermit hangs the straw-clad cell,†
Emerging gently from the leafy dell;

* A kind of an arbour on the side of a hill.

† A grotesque building, contrived by a young gentleman, who used on occasion to appear in the character of a hermit.

By Fancy planned; as once th' inventive maid
Met the hoar sage amid the secret shade;
Romantic spot! from whence in prospect lies
Whate'er of landscape charms our feasting eyes;
The pointed spire, the hall, the pasture-plain,
The russet fallow, or the golden grain,
The breezy lake that sheds a gleaming light,
Till all the fading picture fail the sight.

Each to his task; all different ways retire;
Cull the dry stick; call forth the seeds of fire;
Deep fix the kettle's props, a forky row,
Or give with fanning hat the breeze to blow.

Whence is this taste, the furnish'd hall forgot,
To feast in gardens, or the unhandy grot?
Or novelty with some new charms surprises,
Or from our very shifts some joy arises.
Hark, while below the village-bells ring round,
Echo, sweet nymph, returns the soften'd sound;
But if gusts rise, the rushing forests roar,
Like the tide tumbling on the pebbly shore.

Adown the vale, in lone, sequester'd nook,
Where skirting woods embrown the dimpling brook,
The ruin'd convent lies; here wont to dwell
The lazy canon midst his cloister'd cell; *
While papal darkness brooded o'er the land,
Ere Reformation made her glorious stand:
Still oft at eve belated shepherd-swains
See the cowl'd spectre skim the folded plains.

To the high Temple would my stranger go, †
The mountain-brow commands the woods below:

* The ruins of a priory, founded by Peter de Rupibus, Bishop of Winchester.

† The remains of a preceptory of the Knights Templars; at least it was a farm dependent upon some preceptory of that order. I find it was a preceptory called the Preceptory of Sudington; now called Southington.

In Jewry first this order found a name,
When madding Croisades set the world in flame;
When western climes, urged on by Pope and priest,
Pour'd forth their millions o'er the deluged East:
Luxurious knights, ill suited to defy
To mortal fight Turcéstan chivalry.
Nor be the Parsonage by the muse forgot;
The partial bard admires his native spot;
Smit with its beauties, loved, as yet a child,
(Unconscious why) its scapes grotesque, and wild.
High on a mound th' exalted gardens stand,
Beneath, deep valleys scoop'd by Nature's hand.
A Cobham here, exulting in his art,
Might blend the General's with the Gardener's part;
Might fortify with all the martial trade
Of rampart, bastion, fosse, and palisade;
Might plant the mortar with wide threatening bore,
Or bid the mimic cannon seem to roar.
Now climb the steep, drop now your eye below,
Where round the blooming village orchards grow;
There, like a picture, lies my lowly seat,
A rural, shelter'd, unobserved retreat.
Me far above the rest Selbornian scenes,
The pendent forests, and the mountain greens
Strike with delight; there spreads the distant view,
That gradual fades till sunk in misty blue:
Here Nature hangs her slopy woods to sight,
Rills purl between, and dart a quivering light.

SELBORNE HANGER

A WINTER PIECE

TO THE MISS BATTIES

THE Bard, who sang so late in blithest strain
Selbornian prospects, and the rural reign,
Now suits his plaintive pipe to sadden'd tone,
While the blank swains the changeful year bemoan.
How fallen the glories of these fading scenes!
The dusky beech resigns his vernal greens,
The yellow maple mourns in sickly hue,
And russet woodlands crowd the dark'ning view.
Dim, clustering fogs involve the country round,
The valley and the blended mountain-ground
Sink in confusion; but with tempest-wing
Should Boreas from his northern barrier spring,
The rushing woods with deafening clamour roar,
Like the sea tumbling on the pebbly shore.
When spouting rains descend in torrent tides,
See the torn Zigzag weep its channel'd sides:
Winter exerts its rage; heavy and slow,
From the keen east rolls on the treasured snow;
Sunk with its weight the bending boughs are seen,
And one bright deluge whelms the works of men.
Amidst this savage landscape, bleak and bare,
Hangs the chill hermitage in middle air;
Its haunts forsaken, and its feasts forgot,
A leaf-strown, lonely, desolated cot!
Is this the scene that late with rapture rang,
Where Delphy danced, and gentle Anna sang;
With fairy-step where Harriet tripped so late,
And on her stump reclined the musing Kitty sate?
Return, dear Nymphs; prevent the purple spring,

Ere the soft nightingale essays to sing;
Ere the first swallow sweeps the freshening plain,
Ere love-sick turtles breathe their amorous pain,
Let festive glee th' enliven'd village raise,
Pan's blameless reign, and patriarchal days;
With pastoral dance the smitten swain surprise,
And bring all Arcady before our eyes.
Return, blithe maidens; with you bring along
Free, native humour, all the charms of song,
The feeling heart, and unaffected ease,
Each nameless grace, and every power to please.

Nov. 1st, 1763.

ON THE DARK, STILL, DRY, WARM WEATHER,

OCCASIONALLY HAPPENING IN THE WINTER MONTHS

Th' imprison'd winds slumber within their caves
Fast bound: the fickle vane, emblem of change,
Wavers no more, long-settling to a point.
All nature nodding seems composed: thick steams
From land, from flood up-drawn, dimming the day,
"Like a dark ceiling stand:" slow thro' the air
Gossamer floats, or stretch'd from blade to blade
The wavy net-work whitens all the field.
Push'd by the weightier atmosphere, up springs
The ponderous Mercury, from scale to scale
Mounting, amidst the Torricellian tube.*

While high in air, and pois'd upon his wings
Unseen, the soft, enamour'd wood-lark runs
Thro' all his maze of melody;—the brake
Loud with the black-bird's bolder note resounds.

* The Barometer.

Sooth'd by the genial warmth, the cawing rook
Anticipates the spring, selects her mate,
Haunts her tall nest-trees, and with sedulous care
Repairs her wicker eyrie, tempest torn.
The ploughman inly smiles to see upturn
His mellow glebe, best pledge of future crop;
With glee the gardener eyes his smoking beds;
E'en pining sickness feels a short relief.

The happy schoolboy brings transported forth
His long-forgotten scourge, and giddy gig:
O'er the white paths he whirls the rolling hoop,
Or triumphs in the dusty fields of taw.
Not so the museful sage:—abroad he walks
Contemplative, if haply he may find
What cause controls the tempest's rage, or whence
Amidst the savage season winter smiles.
For days, for weeks, prevails the placid calm.
At length some drops prelude a change: the sun
With ray refracted bursts the parting gloom;
When all the chequer'd sky is one bright glare.
Mutters the wind at eve: th' horizon round
With angry aspect scowls: down rush the showers,
And float the delug'd paths, and miry fields.

ON THE RAINBOW

"Look upon the Rainbow, and praise him that made it; very beautiful is the brightness thereof."—Eccles. xliii. 11.

On morning or on evening cloud impress'd,
Bent in vast curve, the watery meteor shines
Delightfully, to the levell'd sun opposed;
Lovely refraction! while the vivid brede

In listed colours glows, th' unconscious swain
With vacant eyes gazes on the divine
Phenomenon, gleaming o'er the illumined fields,
Or runs to catch the treasures which it sheds.
  Not so the sage, inspired with pious awe;
He hails the federal arch; * and looking up,
Adores that God, whose fingers form'd this bow
Magnificent, compassing heaven about,
With a resplendent verge, "Thou madest the cloud,
Maker Omnipotent, and thou the bow;
And by that covenant graciously hast sworn
Never to drown the world again: † henceforth,
Till time shall be no more, in ceaseless round,
Season shall follow season: day to night,
Summer to winter, harvest to seed time,
Heat shall to cold in regular array
Succeed."—Heaven-taught, so sang the Hebrew bard.‡

A HARVEST SCENE

Waked by the gentle gleamings of the morn,
Soon clad, the reaper, provident of want,
Hies cheerful-hearted to the ripen'd field;
Nor hastes alone; attendant by his side
His faithful wife, sole partner of his cares,
Bears on her breast the sleeping babe; behind,
With steps unequal, trips her infant train:
Thrice happy pair, in love and labour join'd!
  All day they ply their task; with mutual chat,
Beguiling each the sultry, tedious hours.
Around them falls in rows the sever'd corn,
Or the shocks rise in regular array.

* Gen. ix. 12–17. † Gen. viii. 22. ‡ Moses.

But when high noon invites to short repast,
Beneath the shade of sheltering thorn they sit,
Divide the simple meal, and drain the cask:
The swinging cradle lulls the whimpering babe,
Meantime; while growling round, if at the tread
Of hasty passenger alarm'd, as of their store
Protective, stalks the cur with bristling back,
To guard the scanty scrip and russet frock.

THE NATURALIST'S CALENDAR

PRINCIPAL EVENTS

Event.	*Gilbert White.*	*Markwick.*	*Marsham* (1736–1925).	*Averages of the Royal Met. Soc.* (1891–1925). *S.E. England.*	*British Isles.*
Hazel flowers	Jan. 3–Feb. 28	Jan. 21–Mar. 11	—	Feb. 1	Feb. 14
Throstle sings	Jan. 6–22	Jan. 15–Apr. 4	Nov. 20–Mar. 20 (Average Jan. 27)	Jan. 14	Jan. 23
Honey bee appears	Jan. 6–Mar. 19	Jan. 31–Apr. 11	—	Feb. 25	Mar. 4
Snowdrop flowers	Jan. 10–Feb. 5	Jan. 18–Mar. 1	Dec. 15–Feb. 19 (Average Jan. 16)	—	—
Bat appears	Jan. 16–Mar. 24	Feb. 6–June 1	—	—	—
Crocus flowers	Jan. 17–Mar. 18	Jan. 20–Mar. 19	—	—	—
Brimstone Butterfly appears	Feb. 13–Apr. 2	Feb. 13–Mar. 8	Jan. 14–May 3 (Average Mar. 20)	—	—
Coltsfoot flowers	Feb. 15–Mar. 23	Feb. 18–Apr. 13	—	Feb. 27	Mar. 5
Rooks build	Feb. 16–Mar. 6	Feb. 28–Mar. 5	Feb. 2–Mar. 26 (Average Mar. 2)	—	—
Frogs croak	Feb. 25	Mar. 9–Apr. 20	Feb. 22–May 31 (Average Mar. 24)	—	—
Wryneck appears	Mar. 5–Apr. 25	Mar. 26–Apr. 23	—	—	Apr. 13
Wood anemone flowers	Mar. 17–Apr. 22	Feb. 27–Apr. 10	Feb. 13–Apr. 25 (Average Mar. 26)	Mar. 23	Apr. 1
Wheatear appears	Mar. 18–30	Mar. 13–May 23	—	—	Apr. 7
Chiffchaff appears	Mar. 19–Apr. 13	Mar. 30–May 16	—	—	Apr. 5
Sand-martin appears	Mar. 21–Apr. 12	Apr. 8–May 16	—	—	Apr. 20
Swallow appears	Mar. 26–Apr. 20	Apr. 7–27	Apr. 3–May 12	Apr. 15	Apr. 21
Blackcap appears	Mar. 26–May 4	Apr. 14–May 18	—	—	Apr. 23
Martin appears	Mar. 28–May 1	Apr. 14–May 8	—	—	Apr. 27
Nightingale sings	Apr. 1–May 1	Apr. 5	Apr. 2–May 23	Apr. 22	May 5
Elm leafs	Apr. 3	Apr. 2–May 19	Feb. 9–May 4	—	—
Blackthorn flowers	Apr. –May 10	Mar. 16–May 8	—	Apr. 4	Apr. 11
Cuckoo heard	Apr. 7–26	Apr. 15–May 3	Apr. 12–May 7	Apr. 17	Apr. 26
Beech leafs	Apr. 10–May 8	Apr. 24–May 25	Mar. 15–May 12	—	—
Swift appears	Apr. 13–May 7	Apr. 28–May 19	—	—	May 4
Hawthorn flowers	Apr. 20–June 11	Apr. 19–June 26	Apr. 15–June 8	—	—
Nightjar or Fern Owl appears	May 1–26	May 16	Apr. 27–July 9	—	May 13
Horse-chestnut flowers	May 21–June 9	Apr. 19–June 7	—	May 6	May 13
Ivy flowers	Sept. 12–Oct. 2	Sept. 18–Oct. 28	—	Sept. 26	Oct. 3

A COMPLETE SYNONYMY OF SPECIES REFERRED TO IN THE "NATURAL HISTORY OF SELBORNE"

In this list the English and scientific names used by Gilbert White are equated so far as possible with the English and scientific name accepted at the present time. Domestic varieties are not included. With animals of which British subspecies are now distinguished the precise name of the form obviously intended is given, although in everyday use the subspecific prefix (like the 'British' in British Robin) is left out.

MAMMALIA

English Name used by Gilbert White.	*English Name in use now.*	*Scientific Name used by Gilbert White.*	*Scientific Name in use now.*
Great large bat	Noctule bat	Vespertilio altivolens, or vespertilio	Nyctalus Noctula (Schreber)
Common or little bat or bat	Pipistrelle bat	Vespertilio murinus (mistake)	P. Pipistrellus (Schreber)
"	Long-eared bat	Vespertilio auritus	Plecotus auritus (Linnæus)
Hedgehog	Hedgehog	—	Erinaceus europæus (Linnæus)
Otter	Otter	—	Lutra lutra (Linnæus)
Shrew-mouse	Common shrew	—	Sorex araneus (Linnæus)
Water shrew-mouse	Water shrew	—	Neomys fodiens bicolor (Shaw)
White hare	Mountain or blue hare	—	Lepus timidus scoticus (Hilzheimer)
Rabbit	Rabbit	—	Oryctolagus cuniculus (Linnæus)
Squirrel	British or light-tailed squirrel	—	Sciurus leucourus (Kerr)
Small mice or little red mice	Harvest mouse	Mus minimus	Micromys minutus sorocinus (Hermann)
Large white-bellied field mouse	Field mouse or long-tailed field mouse	—	Apodemus sylvaticus sylvaticus (Linnæus)
"	Common grass mouse or field vole	Mus terrestris	Microtus Hirtus (Bellamy)
Common mouse	House mouse	Mus medius domesticus or Mus domesticus medius (Ray)	Mus musculus (Linnæus)
Water rat	South British water rat or water vole	Mus amphibius or Amphibius mus	Arvicola amphibius amphibius (Linnæus)
Red deer	Red deer	—	Cervus elaphus (Linnæus)
Fallow deer	Fallow deer	—	Cervus dama (Linnæus)
Elk or moose or moose deer	Elk or moose	—	Alces machlis
Cane weasel	Weasel (female)	—	Putorius nivalis (Linnæus)
	Weasel (male)		
Stoat	Stoat	—	Putorius ermineus (Linnæus)
Polecat	Polecat	—	Putorius putorius (Linnæus)
Squnck or Stonck	Skunk	—	Mephitis Mephitica
Fox	Fox	Canis vulpes	Canis vulpes (Linnæus)

AVES (BIRDS)

Raven	Raven	Corvus (Ray)	Corvus c. corax (Linnæus)
Crow	Carrion crow	—	Corvus c. corone (Linnæus)
Royston or Grey Crow	Hooded crow	Cornix cinerea (Ray)	Corvus c. cornix (Linnæus)
Rook	Rook	Cornix frugilega (Ray)	Corvus f. frugilegus (Linnæus)
Jackdaw or daw	Jackdaw	Corvus monedula	Coloeus monedula spermologus (Vieillot)
Magpie	Magpie	—	Pica p. pica (Linnæus)
Jay	British jay	—	Garrulus glandarius rufitergum (Hartert)
Cornish chough	Chough	—	Pyrrhocorax pyrrhocorax (Linnæus)
Starling	Starling	—	Sturnus v. vulgaris (Linnæus)
Golden thrush	Golden oriole	—	Oriolus O. oriolus (Linnæus)
Grossbeak	Hawfinch	Loxia coccothraustes	Coccothraustes c. coccothraustes (Linnæus)
Greenfinch	Greenfinch	Chloris (Ray)	Chloris c. chloris (Linnæus)
Goldfinch	British goldfinch	Carduelis (Ray)	Carduelis c. britannica (Hartert)
Aberdavine	Siskin	—	Spinus spinus (Linnæus)
Linnet or common linnet	Linnet	Linaria vulgaris (Ray)	Acanthis c. cannabina (Linnæus)
Canary bird	Canary	—	Serinus c. canarius (Linnæus)
Bullfinch	British bullfinch	Pyrrhula (Ray)	Pyrrhula p. nesa (Mathews and Iredale)

English Name used by Gilbert White.	*English Name in use now.*	*Scientific Name used by Gilbert White.*	*Scientific Name in use now.*
Crossbill, crossbill or crossbeak	Common crossbill	Loxia curvirostra	Loxia c. curvirostra (Linnæus)
Chaffinch	Chaffinch	Fringilla (Ray)	Fringilla c. coelebs (Linnæus)
House-sparrow . .	House-sparrow	—	Passer d. domesticus (Linnæus)
Bunting	Corn-bunting or common bunting	Emberiza milaria or E. alba (Ray)	Emberiza c. calandra (Linnæus)
Yellowhammer . .	Yellowhammer or yellow bunting	E. flava (Ray)	Emberiza c. citrinella (Linnæus)
Thick-billed reed-sparrow	Reed-bunting	Passer torquatus (Ray)	Emberiza s. schoeniclus (Linnæus)
Snowflake, snowfleck or greater brambling	Snow-bunting	Emberiza nivalis	Plectrophenax nivalis (Linnæus)
Skylark	Skylark	Alauda vulgaris (Ray)	Alauda a. arvensis (Linnæus)
Woodlark	Woodlark	Alauda arborea (Ray)	Lullula a. arborea (Linnæus)
Titlark	Meadow-pipit, tree-pipit	Alauda pratorum or A. pratensis (Ray)	Anthus pratensis (Linnæus) A. t. trivialis (Linnæus)
Yellow wagtail . .	Yellow wagtail	Motacilla flava (Ray)	Motacilla flava rayi (Bonaparte)
Grey wagtail . . .	Grey wagtail	M. cinerea (Ray)	M. c. cinerea (Tunstall)
White or grey-and-white wagtail	Pied wagtail	M. alba (Ray)	M. alba yarrellii (Gould)
Nuthatch	British nuthatch	Sitta europea	Sitta europea affinis (Blyth)
Great titmouse, great black-headed titmouse, or oxeye	British great titmouse	Fringillago (Ray)	Parus major newtoni (Prazak)
Blue titmouse or nun	British blue titmouse	Parus coeruleus	Parus coeruleus obscurus (Prazak)
Cole-mouse . . .	British coal titmouse	Parus ater	P. ater britannicus (Sharpe & Dresser)
Marsh-titmouse . .	British marsh titmouse, British willow titmouse (in America chickadee)	P. palustris	P. palustris dresseri (Stejneger) P. atricapillus kleinschmidti (Hellmayr)
Long-tailed titmouse.	British long-tailed titmouse	—	Aegithalos caudatus roseus (Blyth)
Golden-crowned or golden-crested wren	British golden-crested wren or goldcrest	Regulus cristatus (Ray)	Regulus r. anglorum (Hartert)
Great ash-coloured butcher-bird	Great grey shrike	—	Lanius e. excubitor (Linnæus)
Red-backed butcher-bird	Red-backed shrike	Lanius collurio	L. collurio (Linnæus)
,,	Woodchat shrike	Lanius minor cinerascens cum macula in scapulis alba (Ray)	L. s. senator (Linnæus)
German silk-tail . .	Waxwing	Garrulus bohemicus (Ray)	Ampelis g. garrulus (Linnæus)
Fly-catcher . . .	Spotted flycatcher	Stoparola or Muscicapa grisola (Linnæus)	Muscicapa s. striata (Pallas)
Smallest willow-wren, chirper or chiff-chaff	Chiffchaff	Motacilla trochilus or Regulus non cristatus (Ray)	Phylloscopus c. collybita (Vieillot)
Middle willow-wren ("the songster")	Willow-wren or willow-warbler	Motacilla trochilus (Linnæus) or Regulus non cristatus (Ray)	P. t. trochilus (Linnæus)
Largest willow-wren	Wood-wren or wood-warbler	Motacilla trochilus (Linnæus) or Regulus non cristatus (Ray)	P. s. sibilatrix (Bechstein)
Grasshopper-lark .	Grasshopper warbler	Alauda trivialis (Linnæus) *in error* or Alauda minima locustae voce (Ray)	Locustella n. naevia (Boddaert)
Lesser reed-sparrow or sedge-bird	Sedge-warbler	Passer arundinaceus minor (Ray)	Acrocephalus s. schoenoboenus (Linnæus)
Pettichaps (supposed)	Lesser whitethroat	—	Sylvia c. curruca (Linnæus)
Black-cap	Blackcap	Atricapilla (Ray) or Motacilla atricapilla (Linnæus)	S. atricapilla (Linnæus)
Whitethroat or white-throat	Whitethroat or greater whitethroat	Ficedulae affinis (Ray) or Motacilla sylvia (Linnæus)	S. c. communis (Latham)
Fieldfare	Fieldfare	Turdus pilaris (Ray)	T. pilaris (Linnæus)
Missel-bird or missel-thrush	Mistlethrush	Turdus viscivorus (Ray)	T. v. viscivorus (Linnæus)
Thrush or song-thrush	British song-thrush or throstle	Turdus or Turdus simpliciter dictus (Ray)	T. philomelus clarkei (Hartert)
Redwing or redwing-fieldfare	Redwing	Turdus iliacus (Ray)	T. musicus (Linnæus)
Ring-ouzel or ring-ousel	Ring-ouzel	Merula torquata (Ray) or Turdus torquatus	T. torquatus torquatus (Linnæus)
Blackbird	Blackbird	Merula or Merula vulgaris (Ray)	T. m. merula (Linnæus)
Blue thrush . . .	Blue rock-thrush	—	Monticola s. solitarius (Linnæus)
Wheat-ear or wheatear	Wheatear	Oenanthe (Ray)	Oenanthe œ. œnanthe (Linnæus)
Whin-chat or whinchat	Whinchat	Oenanthe secunda (Ray)	Saxicola r. rubetra (Linnæus)
Stone-chatter . . .	British stonechat	Oenanthe tertia (Ray)	S. torquata hibernans (Hartert)
Red-start or redstart	Redstart	Ruticilla (Ray)	Phoenicurus p. phoenicurus (Linnæus)
Nightingale . . .	Nightingale	Luscinia (Ray)	Luscinia m. megarhynca (C. L. Brehm)

English Name used by Gilbert White.	*English Name in use now.*	*Scientific Name used by Gilbert White.*	*Scientific Name in use now.*
Red-breast or redbreast	British robin or redbreast	Rubecula (Ray)	Erithacus rubecula melophilus (Hartert)
Hedge-sparrow . .	Hedge-sparrow or dunnock	Curruca (Ray)	Accentor modularis occidentalis (Hartert)
Wren	Wren	Passer troglodytes (Ray)	Troglodytes t. troglodytes (Linnæus)
Water-ousel . . .	Dipper	—	—
Swallow, house-swallow or chimney-swallow	Swallow (in America barn-swallow)	Hirundo domestica or H. Rustica (Linnæus)	H. r. rustica (Linnæus)
House-martin, martin or martlet	Martin or house-martin	Hirundo rustica (? in error), or H. urbica (Linnæus) or H. agrestis (Ray)	Delichon u. urbica (Linnæus)
Bank-martin or sand-martin	Sand-martin (in America bank swallow)	H. riparia (Linnæus and Ray)	Riparia r. riparia (Linnæus)
,,	Crag-martin	H. hyberna (white) or H. rupestris (Scopoli)	Riparia rupestris (Scopoli)
Swift or black-martin	Swift	H. Apus (Linnæus and Ray)	Apus a. apus (Linnæus)
,,	Esculent swiftlet	H. esculenta	Collocalia sp. ?
Goatsucker, goat-sucker, fern-owl, eve-jarr, caprimulgus, churn-owl, pucker-idge	Nightjar	Caprimulgus (Ray), C. europæus (Linnæus)	C. e. europæus (Linnæus)
Bee-bird	Bee-eater	Merops apiaster	Merops apiaster (Linnæus)
Hoopoe	Hoopoe	Upupa	Upupa e. epops (Linnæus)
King-fisher . . .	Kingfisher	—	Alcedo atthis ispida (Linnæus)
Woodpecker . . .	Woodpecker sp. ?	—	—
Less spotted woodpecker, British	Lesser spotted or barred woodpecker	—	Dryobates minor comminutus (Hartert)
Wryneck	Wryneck	Jynx, sive Torquilla (Ray)	Jynx t. torquilla (Linnæus)
Cuckoo	Cuckoo	Cuculus (Ray), C. canorus (Linnæus)	Cuculus canorus canorus (Linnæus)
Brown owl . . .	British tawny owl	—	Strix aluco sylvatica (Shaw)
Barn-owl or white owl	(White-breasted) barn owl	—	Tyto a. alba. (Scopoli)
Eagle-owl	Eagle-owl	—	Bubo b. bubo (Linnæus)
The *Falco* or haggard-falcon	Peregrine falcon (in America duck-hawk)	Falco	F. p. peregrinus (Linnæus)
Kestrel, kestril or windover	Kestrel	—	F. t. tinnunculus (Linnæus)
Buzzard	Buzzard	—	Buteo b. buteo (Linnæus)
Eagle	Eagle sp. ?	—	Aquila sp. ?
Vulture	Vulture sp. ?	—	—
Hen-harrier, ring-tail hawk (female), blue hawk (male)	Hen harrier, Montagu's harrier	—	Circus cyaneus cyaneus (Linnæus), C. pygargus (Linnæus)
Sparrow-hawk . .	Sparrow-hawk (not in America)	—	Accipiter n. nisus (Linnæus)
Kite	Kite	—	Milvus m. milvus (Linnæus)
Honey-buzzard . .	Honey-buzzard	Buteo apivorus (Linnæus) sive vespivorus (Ray)	Pernis a. apivorus (Linnæus)
Osprey	Osprey	—	Pandion h. haliaetus (Linnæus)
Booby	Gannet or booby	—	Sula sp ?
Heron	Common heron	—	Ardea c. cinerea (Linnæus)
Flamingo	Flamingo	—	Phoenicopterus sp. ?
Wild-swan . . .	Whooper swan and perhaps mute swan	Cygnus ferus	Cygnus cygnus (Linnæus), C. Olor (Linnæus), A. anser (Linnæus)
Wild-goose . . .	Either grey lag-, white-fronted, bean, or pink-footed goose	Anser ferus	A. albifrons (Scopoli), A. f. fabalis (Latham), A. brachyrhyncus (Baillon)
Wild-duck . . .	Mallard	Anas torquata minor (Ray)	Anas p. platyrhynca (Linnæus)
Pochard	Pochard	Anas fera fusca (Ray)	Nyroca f. ferina (Linnæus)
Wigeon or widgeon .	Wigeon	Penelope (Ray)	Anas penelope (Linnæus)
Teal	Teal	Querquedula (Ray)	Anas c. crecca (Linnæus)
Dabchick	Little grebe or dabchick	—	Podiceps r. ruficollis (Linnæus)
Great speckled diver or loon	Great northern diver	Colymbus glacialis (Linnæus)	Colymbus immer (Brünnich)
Ring-dove . . .	Wood-pigeon or ring-dove	Palumbus torquatus or Palumbus Raii	Columba p. palumbus (Linnæus)
Wood-pigeon, common wild pigeon or stock-dove	Stock-dove	Oenas (Ray) or Vinago (Ray)	Columba oenas (Linnæus)
Turtle-dove . . .	Turtle-dove	Turtur or T. aldrovandi (?)	Streptopelia t. turtur (Linnæus)
Stone-curlew . . .	Stone-curlew	Charadrius oedicnemus	Burhinus œ. œdicnemus (Linnæus)
Lapwing	Lapwing	—	Vanellus vanellus (Linnæus)
Sandpiper . . .	Common sandpiper	Tringa hypoleucus	T. hypoleucos (Linnæus)
Snipe	Common snipe	Gallinago minor (Ray)	Capella g. gallinago (Linnæus)
Jack snipe . . .	Jack snipe	Gallinago minima (Ray)	Lymnocryptes minimus (Brünnich)

English Name used by Gilbert White.	*English Name in use now.*	*Scientific Name used by Gilbert White.*	*Scientific Name in use now.*
Woodcock	Woodcock	Scopolax (Ray)	Scopolax r. rusticola (Linnæus)
Puffin	Puffin	—	Fratercula arctica grabae (Brehm)
Little auk	Little auk	—	Alle alle (Linnæus)
Bustard	Great bustard	Otis	Otis t. tarda (Linnæus)
Crane	Crane sp. ?	—	—
Land-rail or daker-hen	Corncrake or land-rail	Ortygometra (Ray) or Rallus crex (Linnæus)	Crex crex (Linnæus)
Moor-hen	Moorhen (in America gallinule)	—	Gallinula c. chloropus (Linnæus)
Coot	Coot	—	Fulica a. atra (Linnæus)
Black-game, grouse, or heath-cock	(British) black grouse	—	Lyrurus tetrix britannicus (Witherby and Lonnberg) (Linnæus)
Pheasant	Pheasant	—	Phasianus colchicus (Linnæus)
Partridge	Common partridge	—	Perdix. p. perdix (Linnæus)
Quail	Quail	—	Coturnix c. coturnix (Linnæus)
AMPHIBIA AND REPTILIA (AMPHIBIANS AND REPTILES)			
Frog	Common frog	Rana temporaria	Rana temporaria
,,	Edible frog	Rana arborea	Hyla arborea
Toad	Common toad	Rana bufo	Bufo vulgaris
Large black warty lizard	Crested newt	—	Triton cristatus
Land tortoise	—	—	Testudo ibera
Water newt or eft	Common newt	Salamandra aquatica	Triton vulgaris
Blind worm	Slow-worm or blind-worm	Anguis fragilis	Anguis fragilis
Mud inguana	Iguana	—	Iguana tuberculata ?
Green lizard	Probably sand-lizard	—	Lacerta agilis
Guernsey lizard	Green or emerald lizard	—	L. viridis
Common snake	Grass-snake or ringed snake	Coluber natrix	Tropidonotus natrix
Viper or adder	Viper or adder	Coluber berus	Vipera berus
PISCES (FISHES)			
Bull's head or Miller's thumb	Miller's thumb	Gobius fluviatilis capitatus	Cottus gobio
Stickle-back	3-spined stickleback	Gasterosteus aculeatus Pisciculus aculeatus	Gasterosteus aculeatus
	10-spined stickleback	Gasterosteus pungitius	G. pungitius
Minnow	Minnow	—	Phoxinus phoxinus or Ph. laevis
Trout	Trout	Trutta fluviatilis	Salmo trutta
Eel	Common eel	Anguilla	Anguilla vulgaris
Lampern	Lampern	Lampætra parva et fluviatilis	Petromyzon or Lampetra fluviatilis
Loach	Probably spined loach	—	Cobitis taenia
INVERTEBRATA (INSECTS, SPIDERS, MOLLUSCS, ETC.)			
Earth-worm	Earthworm	—	Oligochaeta (sp. ?)
Shell-snail	—	Helix nemoralis	Helix nemoralis (Linnæus)
Slug or shell-less snail	—	Limax	Limax or Arion sp. ?
Wood-lice	—	Oniscus asellus	Oniscus asellus (Linnæus)
Spider	Spider	—	(Family) Araneae
Harvest bug	—	Acarus sp. ?	Trombidium sp. ?
Field cricket	Field cricket	Grillus campestris	Gryllus campestris (Linnæus)
House cricket	House cricket	Grillus domesticus	Gryllus domesticus (Linnæus)
Mole-cricket	Mole cricket	Grillus grillotalpa	Gryllotalpa vulgaris
Dragon-fly	Dragonfly	Libellula	(Family) Odonata
May-fly or angler's may-fly	May-fly	Ephemera vulgata, E. cauda biseta	Ephemera vulgata (Linnæus)
Cadew-fly	Caddis fly	Phryganea	Phryganea sp. ?
Humble-bee	Bumble-bee	—	Bombus sp. ?
Wasp	—	—	Vespa sp. ?
Turnip fly, black-dolphin	—	Coleoptera sp. ?	Phyllotreta nemorum (Linnæus)
Fern-chafer	—	Scarabeus solstitialis	Rhizotragus solstitialis (Linnæus)
Cockchaffer, May-chaffer or May-bug	Cock-chafer	Scarabeus melolontha	Melolontha vulgaris (Linnæus)
,,	—	Scarabeus fullo	Melolontha fullo (Linnæus)
Glow-worm	Glow-worm	—	Lampyris noctiluca (Linnæus)
Scarab	Beetles	Coleoptera	(Order) Coleoptera
,,	Butterflies and moths	Lepidoptera	Lepidoptera
,,	Oak tortrix	Phaloena quercus or P. viridata	Tortrix viridana
Fly	—	Musca	(Order) Diptera
Long-legs or gnat	—	Tipula or Empedes	(Family) Tipulidae
Small aphide or smother-fly	—	—	(Family) Aphidae
Star-tailed maggot	—	Musca chamaeleon	Stratiomys chamaeleon (Linnæus)

English Name used by Gilbert White.	*English Name in use now.*	*Scientific Name used by Gilbert White.*	*Scientific Name in use now.*
Forest-fly or side-fly	Forest fly	—	Hippobosca equina
,,	—	Hippobosca hirundinis	Stenopteryx hirundinis
,,	—	Musca putris (Linn.) var. ?	Piophila casei (Linnæus)
Horse bot-fly or gad-fly	—	Oestrus curvicauda	Gastrophilus intestinalis (De G.)
Flea, bed-flea (in error)	—	Pulex irritans	Pulex bifasciatus (Curtis)
		FLORA (PLANTS)	
Stinking hellebore, bear's foot or setterwort	Stinking hellebore	Helleborus foetidus	Helleborus foetidus (Linnæus)
Green hellebore . .	Green hellebore	H. viridis	H. viridis Linn. *var.* Smithianus (A. Braun)
Water-lily . . .	Water-lily	Nymphaea	Nymphaea sp. ?
Tutsan, St. John's wort	Tutsan, St. John's wort	Hypericum androsaemum	Hypericum androsaemum (Linnæus)
Furze, goss . . .	Gorse or furze	—	Ulex sp. ?
Narrow-leaved or wild lathyrus	Wild pea	Lathyrus sylvestris	Lathyrus sylvestris (Linnæus)
Purple comarum or marsh cinquefoil	Marsh cinquefoil	Comarum palustre	Potentilla palustris (Scopoli)
Opposite golden saxifrage	Opposite golden saxifrage	Chrysosplenium oppositifolium	Chrysosplenium oppositifolium (Linnæus)
Round-leaved sundew	Common sundew	Drosera rotundifolia	Drosera rotundifolia (Linnæus)
Long-leaved sundew	Lesser long-leaved sundew	Drosera longifolia	D. longifolia (Linnæus)
Ivy	Ivy	—	Hedera helix (Linnæus)
Dwarf elder, walwort, or danewort	Danewort	Sambucus ebulus	Sambucus ebulus (Linnæus)
Small teasel . . .	Shepherd's rod	Dipsacus pilosus	Dipsacus pilosus (Linnæus)
Lettuce	Lettuce	—	Lactuca sp. ?
Sow-thistle . . .	Sowthistle	—	Sonchus sp. ?
Dandelion . . .	Dandelion	—	Taraxacum sp. ?
Creeping bilberries or cranberries	Cranberry	Vaccinium oxycoccos	Oxycoccos quadripetala (Gilib.)
Whortle or bleaberries	Bilberry, blaeberry, bleaberry, whinberry, whortle-berry	Vaccinium myrtillus	Vaccinium myrtillus (Linnæus)
Heath, grig . . .	Heath (popularly "heather")	—	Erica sp. ?
Ling	Ling, "heather"	—	Calluna sp. ?
Yellow monotropa or birds-nest	Birds-nest	Monotropa hypopithys	Monotropa hypopithys (Linnæus)
Ash	Ash	—	Fraxinus excelsior (Linnæus)
Perfoliated yellow-wort	Yellow-wort	Chlora perfoliata (Linn.), Blackstonia perfoliata (Hudson)	Blackstonia perfoliata (Hudson)
Less periwinkle . .	Lesser periwinkle	Vinca minor	Vinca minor (Linnæus)
Autumnal gentian or fell-wort	Autumn gentian	Gentiana amarella	Gentiana amarella (Linnæus)
Tooth-wort . . .	Toothwort	Lathræa squamaria	Lathræa squamaria (Linnæus)
Plantain	Plantain	—	Plantago sp. ?
Mezereon	Mezereon	Daphne mezereum	Daphne mezereum (Linnæus)
Spurge laurel . . .	Spurge laurel	Daphne laureola	Daphne laureola (Linnæus)
Broad-leaved elm or wych hazel	Wych elm	Ulmus folio latissimo scabro (Ray)	Ulmus montana (Stokes)
Alder	Alder	—	Alnus glutinosa (Gaertn.)
Beech	Beech	—	Fagus sylvatica (Linnæus)
Oak	British oak	—	Quercus robur (Linnæus)
Willow	Willow	—	Salix sp. ?
Cuckoo-pint . . .	Cuckoo-pint, lords and ladies	Arum	Arum maculatum (Linnæus)
Duck's meat . . .	Duck-weed	Lemna	? Lemna minor (Linnæus)
Helleborine . . .	Broad-leaved helleborine	Serapias latifolia	Epipactis latifolia (Sw.)
Birds' nest ophrys .	Bird's nest orchid	Ophrys nidus avis	Neottia nidus-avis (Rich.)
Ladies' traces . .	Ladies' tresses	Ophrys spiralis	Spiranthus spiralis (Koch)
Vernal crocus . .	Spring crocus	Crocus sativus	Prob. C. officinalis (Hudson) or C. vernus (Miller)
Autumnal crocus .	Meadow saffron, autumn crocus	Crocus sativus	Prob. Colchicum autumnale (Linnæus)
Herb of Paris, true-love or one-berry	Herb Paris	Paris quadrifolia	Paris quadrifolia (Linnæus)
Common soft rush .	Common soft rush	Juncus effusus	Juncus effusus (Linnæus)
Fern	Bracken	—	Pteris aquilina (Linnæus)
Great golden maidenhair or silkwood	—	Polytrichum commune	Polytrichum commune (Linnæus)
,,	Ferns	Filices	Order Filices
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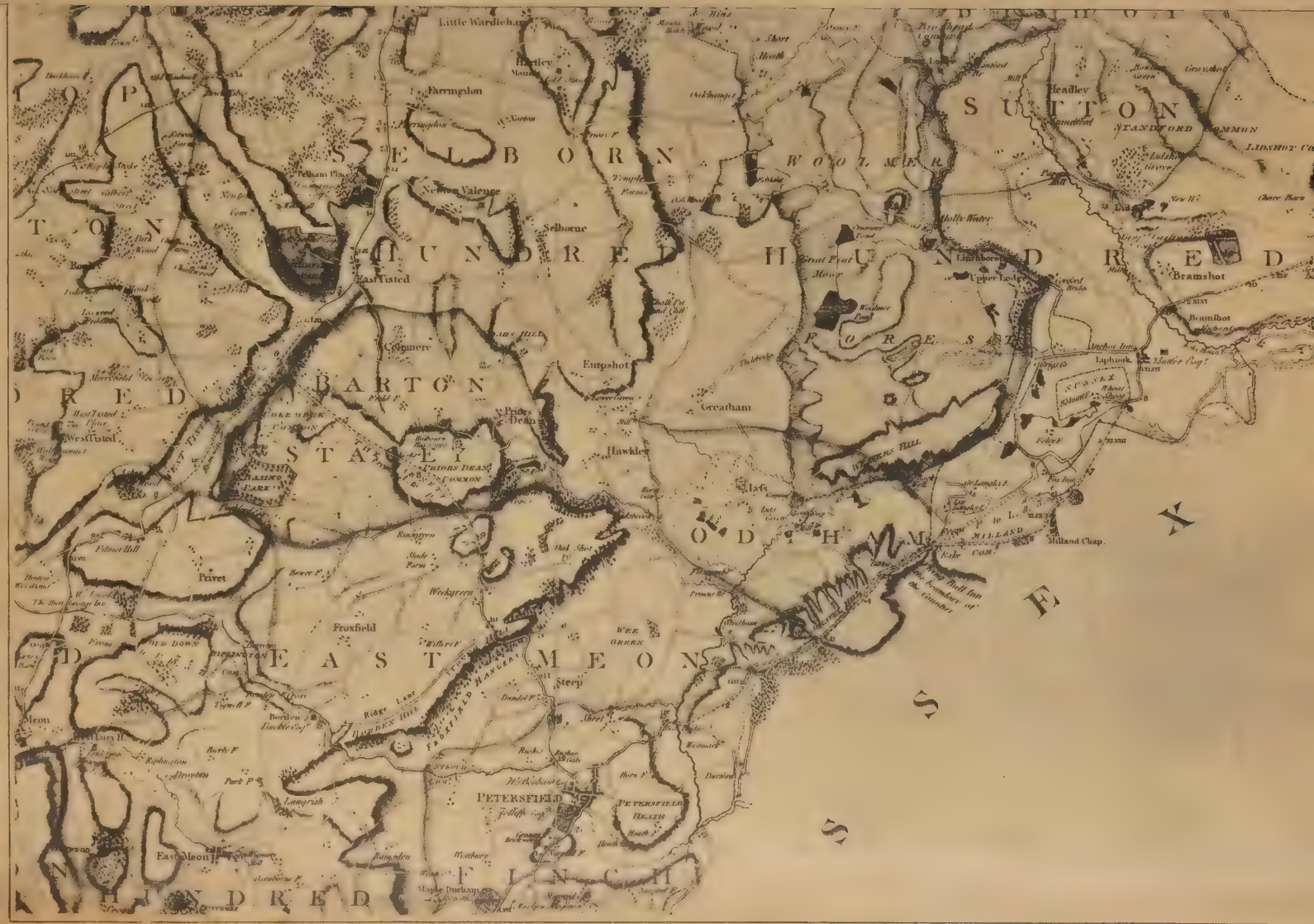
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